The role of subjective well-being in mediating the psychological impact of obesity

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This thesis is submitted in partial fulfilment of the requirements for the award of the Degree of Doctor of Philosophy of Liverpool John Moores University

May 2014

Declaration

Whilst registered as a candidate for the above degree, I have not been registered for any other research award. The results and conclusions embodied in this thesis are the work of the named candidate and have not been submitted for any other academic award.

Acknowledgements

Firstly, I would like to thank my Director of Studies, Dr David Mcilroy, who has shown unstinting faith in my ability to complete this thesis, despite the numerous personal difficulties and set-backs that I encountered along the way. His humanity and ability to make me laugh kept me going though the difficult times, and his insightful direction refocused my attention where it needed to be.

I would also like to thank Professor Andy Tattersall and the School of Natural Sciences, without whose support in terms of funding of fees, this course of study would not have been possible. Andy has also provided personal support because his approachability and his inclusive leadership style makes everybody feel valued and equal, irrespective of their position in the institution.

On a personal note, I would like to thank my three wonderful children, Charlie, Lizzie and Tom, for their patience and understanding while I undertook this mammoth task. And finally, my partner Mike for giving me the final push to complete.

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Thesis Abstract

Background: There is an ever increasing population of obese people worldwide (Kelly et al., 2010), with associated increased costs in terms of morbidity and mortality (Berrington de Gonzelez et al., 2010), so there is a need for appropriate public health interventions. Subjective well-being (SWB) has been identified as facilitating health and longevity (Diener & Chan, 2011), so may be a useful mediator to counteract the negative effects of obesity.

Aims: Two major aims of the study were; to identify the facets of SWB that protect against psychological ill-health in the obese and those that activate change.

Method: A mixed-methods approach was taken that included both quantitative cross-sectional survey data based on validated constructs that combine to measure SWB and qualitative longitudinal data based on unstructured interviews. The ideographic approach brought a narrative to the nomothetic data and elevated the study from the 'what' to the 'why'. Two key samples were selected; adolescents (N = 549) and obesity surgery candidates (N = 125) to represent the spectrum of obesity experience.

Results: Findings support the study's aims in highlighting the role of SWB correlates in mapping the pathway to progress in the regulation of obesity. The alignment of the constructs and the configuration of the models accounted for up to 51% of the variance in life-satisfaction, and up to 73% of the variance in self-esteem. Qualitative analysis suggested emerging themes either reflected in the constructs used in the study, or concepts raised in the literature review, such as cognitive dissonance, and illustrated adaptive and maladaptive behavioural processes to the challenges of obesity.

Conclusion: Salient outcomes provide recognition of; the physical appearance anxiety measure (PASTAS), as an identification marker for maladaptive problems at a critical phase

of adolescent development; the role of optimism for agentic shift towards a positive perspective; and the understanding that controlled anti-depressant drug use may facilitate freedom and empowerment for adaptive purposes in a severely obese population.

Chapter 1

Prevalence of obesity

Obesity is a major worldwide problem with 65% of the population living in a country where being overweight or obese causes more deaths than being underweight (World Health Organization, 2009).It is predicted that this trend will continue and that the majority of the world's adults will be overweight or obese by 2030 (Kelly, Yang, Chen, Reynolds, & He, 2008).

The prevalence of obesity in the UK has increased significantly in recent years, and this has been an ongoing cause of concern for some time to such an extent that it was predicted in 2004 that one third of all adults would be obese by 2010 (National Diet & Nutrition Survey, 2004). These predictions proved to be alarmingly accurate with only 39% of women achieving a healthy BMI in 2011, and obesity rates for women reaching 26% in the same period (The Information Centre for Health and Social Care, 2012).There has also been a significant increase in obesity rates for men, with the proportion of men classed as obese in England doubling between 1994 and 2010 to almost 11%, and tripling in Scotland to 12.1% during the same period (Vlassopoulos, Combet & Lean, 2013). This trend has continued in older populations with almost 40% of men and women becoming obese in later life (Vlassopoulos, Combet & Lean, 2013).

However, although the prevalence of obesity in the US it greater than in the UK, it has remained constant since 2006 with approximately 35% of both men and women being classed as obese (Flegal, Carroll, Kit, & Ogden, 2012), so if the UK follows the US trend, the prevalence of obesity could stabilise within the next few years.

Factors that can lead to obesity

A number of factors have been identified as causing the recent increase in obesity including the notion of an obesogenic environment (Hill, & Peters, 1998) which takes a population approach. This term refers to environmental changes that result in reduced physical activity, such as a more sedentary lifestyle (Sallis & Glanz, 2009) and fewer opportunities for exercise both in terms of facilities (French, 2001) and available time (Lee, Burgeson, Fulton, & Spain, 2007), combined with environmental changes that promote excessive calorie intake, such as an increase in the prevalence of low cost fast food outlets (Kant & Graubard, 2004; Swinburn & Egger, 2002), increased acceptability of larger portion sizes (Duffey & Popkins, 2011) along with a higher calorie density of food (Kant & Graubard, 2004), cheaper energy dense processed foods (Swinburn, Sacks, Hall, McPherson, Finegood, & Moodie, 2011), increased consumption of sugar sweetened soft drinks (Duffey & Popkins, 2007), and an increased exposure to fast food advertising (Powell, Schermbeck, Szczypka, Chaloupka, & Braunschweig, 2011), which have led to a more overweight or obese population.

Throsby and Roberts (2010) further support the notion of an obesogenic environment and deem the general drop in the age of onset of puberty and the increase of rates of childhood obesity to be largely influenced by the interaction of genes with the surrounding natural and social environment. Martin, Holsen, Chambers, Bruce, Brooks, Zarcone, et al. (2010) found brain function associated with food motivation to be higher in an obese population than in a non-obese population, making the obese more susceptible to the impact of an obesogenic environment. Moreover, Qi, Chu, Kang, Huang, Rose, Jensen, et al., (2014) found that the positive association between fried food consumption and body mass index was stronger in those with a higher genetic risk score for obesity, suggesting a genetic

predisposition, not only to be drawn to this type of food, but for the weight gain from consumption to be greater than for those with a low or moderate genetic risk score. This difference in susceptibility to an obesogenic environment is further increased by deferred gratification also being poorer in the obese (Weller, Cook, Avsar, & Cox, 2008), making them less likely to be able to ignore eating cues such as chocolate on display at supermarket tills or advertising hoardings for fast food outlets.

Bell, Rogers, Dietz, Ogden, Schuler and Popovic (2011) recommend that social policy should also address the issue of an obesogenic environment by using strategies to limit fast food outlets, because exposure to fast food outlets is positively associated with greater consumption and higher body mass index (Burgoine, Forouhi, Griffin, Wareham & Monsivais, 2014) and to create open spaces that promote exercise. This recommendation has been partially adopted in the UK using the nudge theory approach, whereby social policies are designed to make the desired outcomes the easy choice (John, Cotterill, Moseley, Richardson, Smith, Stoker, et al., 2011). Nudge theory is based on a "libertarian paternalism approach" (Thaler & Sunstein, 2009, p.6) whereby social policies are devised to influence behaviours that lead to people making decisions that result in healthier, longer lives, while retaining freedom of choice. The implementation of legislative smoking bans in public places is a successful example of this philosophy. Smoking bans in public places were implemented on the premise of reducing passive smoking, but the restrictions on smoking in public places makes it easier to be a non-smoker than a smoker, so the prevalence of smoking decreases and evidence suggests that this two-fold effect leads to a systematic reduction in smoking-related illnesses (Callinan, Clarke, Doherty & Kelleher, 2010), providing support for the nudge approach. The UK government set up a dedicated 'nudge unit' in 2010 (Behavioural Insights Team, 2010) to apply insights from academic research in behavioural economics and

psychology to public policy and services. This approach has resulted in policies to make outdoor adult gym equipment freely available in municipal parks across England and Wales (Robehmed, 2012) along with food consumption-based environmental interventions as part of the Public Health Responsibility Deal (Department of Health, 2013), such as front-of-pack traffic light nutrition labelling and a reduction in advertising of unhealthy food and drink to children, restricting end-of aisle promotions in supermarkets to healthy choice products (Nakamura, Pechey, Suhrcke, Jebb, & Marteau, 2014), and the introduction of 'healthy cash registers' in supermarkets where calorie dense foods are not displayed to avoid impulse buys of these products (Cohen & Babey, 2012). The recency of these interventions means that the long-term impact is yet unknown, but even if they have only a moderate effect on the individual, they affect the entire population so they have an overall positive effect (Lagerros & Rossner, 2013).

Moving away from population-based reasons for weight-gain and focusing on the individual, emotional eating, defined as eating in response to negative affect (Thayer, 2001), is a further factor that could lead to obesity. Emotional eating is more prevalent in obese populations than healthy weight populations who have more adaptive coping strategies not related to food (Faith, Allison & Geliebter, 1997). Sims et al. (2008) found that obese people reported high levels of emotional eating in response to perceived stress, and given that obese people are also at a higher risk than healthy weight people of developing anxiety or depression (de Wit, Luppino, van Straten, Pennix, Zitman, & Cuijpers, 2010), this could be a vicious cycle. Dallman (2010) argued that a combination of stress and emotional brain networks can foster eating behaviours that can lead to obesity. Once the habit of using pleasurable feeding to reduce anxiety levels has been adopted, it becomes reinforced because it reduces the stress response. Therefore, using food to mediate mood can become the default

response in obese individuals and this could partly explain the strong comorbidity between obesity and psychiatric disorders.

Impact of obesity

It has been estimated that 50% of the mortality from the ten leading causes of death is due to behaviour (Kung, Hoyert, Xu, & Murphy, 2008), and obesity falls into this category. Obesity is expected to be the main cause of premature death within 20 years (International Obesity Task Force & Association for the Study of Obesity, 2002) because higher levels of obesity are strongly associated with increased mortality relative to normal weight individuals (Berrington de Gonzalez et al., 2010; Flegal, Graubard, Williamson & Gail, 2005; Flegal, Kit, Orpana, & Graubard, 2013). The impact of obesity on mortality may have decreased somewhat over recent years, perhaps because of improvements in public health and medical care, but despite these improvements mortality rates still remain higher for the obese than for those of the healthy weight population (Flegal et al., 2005).

Obesity carries a significant financial burden to society with preventable obesity related illnesses such as cardiovascular disease, diabetes and cancer currently costing the NHS an estimated £5.1 billion per year (Stephenson, 2013), a figure that is expected to rise by £2 billion per year by 2030 (Wang, McPherson, Marsh, Gortmaker, & Brown, 2011). There is a further financial cost to society with those suffering from obesity related illnesses being unable to work and thus being long-term dependent on state benefits (Gatineau, Hancock & Dent, 2013).

The condition also carries physical and psychosocial burdens which directly impact on quality of life for the individual and result in a significant increase in GP visits when compared to healthy weight individuals (von Lengerke, & Jurgen, 2007). These health issues can be so debilitating that the severely obese (BMI>40kg m^2) are sufficiently disabled by the condition to qualify for disability benefits (Gatineau et al., 2013). Among people with

disabilities, those with a higher BMI are at an increased risk of secondary illnesses (Royal College of Physicians, 2013), with predominantly mobility-related issues affecting the severely obese (Alley, & Chang, 2007) along with mental health issues such as depression (Luppino at al., 2010; Kyrou et al., 2011) and psychological distress associated with social stigma (MacLean et al., 2009).

Obesity carries an associated stigma relating to the belief that weight can be controlled and that obesity reflects character deficits such as being lazy (Latner, Ebneter, & O'Brien, 2012) and a lack of being civilised (Aphramor, & Gingrass, 2008). These perceptions can result in the obese being blamed for their obesity as body weight is often perceived as being within the control of the individual (Dejong, 1993, cited in Klein, Snyder & Gonzalez, 2009). Furthermore, individuals have been found to assume personal power when planning to interact with an obese person in comparison to a non-obese person (Klein et al., 2009), reinforcing the stigma of obesity.

"Body weight is a very visible and easily understood marker of a person's physical status" (Agencies for Nutrition Action, 2001:1, cited in Burns & Gavey, 2008), with those furthest away from the optimal range of leanness having the lowest status. This is likely to impact on general quality of life, psychological well-being and life satisfaction. Severely obese people are 5 times more likely to have experienced serious episodes of depression than people of average weight (Wadden, & Sarner, 2006), and this could be partly due to the impact of social stigma. The stigma of obesity is pervasive with obese individuals being more likely to experience institutional, employment and day-to-day interpersonal discrimination compared to healthy weight individuals (Carr, & Friedman, 2005).

Azevedo, Macaluso, Viola, Sani and Aglioti (2013) found that stigma for obese individuals can be observed at implicit levels in addition to explicit levels. They also found that obesity stigma is modulated by knowledge concerning the aetiology of obesity, with the seemingly surprising result that obesity due to illness may result in greater stigmatization. This adds support to the findings of Pain and Wiles (2006), who conducted a qualitative study in the UK and concluded that obesity related problems are compounded by disability, with those with an additional disability experiencing a greater perceived level of stigma and prejudice.

There has been a significant increase in the attention given to obesity in the media (Hilton, Patterson, & Teyhan, 2012) and there is evidence to suggest that this may have led to an associated increase in the stigma and hostility experienced by obese individuals because obesity has the attention of the public. This is replicated in medical discourse within the paradigm of the personal responsibility framework, which focuses on the undesirability of obesity both socially and medically (Lewis, Thomas, Hyde, Castle, Blood, & Komesaroff, 2010). This is exemplified by Hayden, Dixon, Dixon, Playfair and O'Brien (2010) who suggested that the obese needed to understand that they had contributed to their own stigmatizing experiences by failing to lose the excess weight. This clearly puts the responsibility for obesity stigma experienced with the obese population, and renders the stigmatizing behaviours as acceptable, thus further marginalising the obese (Dickins, Thomas, King, Lewis, & Holland, 2011).

The negative psychological impact of the stigma of obesity could go some way to explain the well-established comorbidity between obesity and both mood and anxiety disorders (Scott, McGee, Wells, & Oakley Browne, 2008; Stunkard, Faith, & Allison, 2003).

Lin, Huang, Tai, Lin, Kao, Tsai, et al (2013) found that over 40% of patients presenting for obesity treatments had a comorbidity of at least one psychiatric disorder. The most prevalent disorders across the patient population were mood disorders, anxiety disorders and eating disorders, and those presenting for surgical treatments had a higher prevalence of binge eating disorder and sleep disorders than those presenting for non-surgical treatments. They concluded that psychiatric evaluation may be in important factor in the treatment of obesity, and that further study of the psychological mechanisms was required.

Weight-loss strategies

The desire to feel "normal" and the longing to "fit in" drives overweight individuals to embark on a range of weight-loss strategies, often repeatedly, with only short-tem success (Glenn, 2013). The most prevalent weight-loss strategies in the UK (Weight Watchers, Slimming World, Rosemary Conley Diet & Fitness, and GP Dietician Services) are based on the 'energy balance equation' whereby the amount of energy expended is greater than the amount of energy consumed, and this is usually achieved by a combination of diet and exercise (Aphramor & Gingrass, 2008; Lagerros & Rossner, 2013), and this type of intervention is more successful for overweight rather than obese people (Wilding, 2007). Although simple caloric restriction of total food intake remains the most effective weight-loss intervention in laboratory settings, it has proved problematic in the real world (Keenan, Wallig, & Haschek, 2013). Caloric restriction relies on the individual making appropriate food choices, but food choices are often made without full conscious awareness (Cohen & Babey, 2012), with food choices of processed products high in fat and sugar being made faster and therefore more automatic, than choices related to natural products such as fruit and vegetables (Thomas, Desai, & Seenivasan, 2011).

Behavioural modification based on Social learning Theory can enhance weight-loss based on diet and exercise to produce a moderate weight-loss of approximately 10%, but this approach is only effective in the short term (Wadden, 2001). Latner, Ciao, Wendicke, Murkani and Durslo, (2013) examined community-based weight-loss treatment programmes based on 20 sessions of behavioural modification applied by group intervention, and found that this approach was generally successful and that benefits may be retained up to18 months later. Weight-loss on a diet and exercise regime can also be accelerated by the use of drug therapy in the form of appetite suppressants, bulking agents or fat absorbers. However, these

are not recommended in the long-term and can have a number of adverse side-effects including insomnia, depression, and faecal incontinence.

Exercise is a key part of traditional weight-loss strategies so schemes that provide gym memberships for exercise on prescription have become a popular strategy for weight-loss (NHS Choices, 2013), but adherence can be problematic. Edmunds, Ntoumanis and Duda, (2007) suggest that increasing adherence to weight-loss exercise programmes could be improved by creating services that foster self-determination via the facilitation of psychological need satisfaction, based on Self-Determination Theory (Deci & Ryan, 1985, cited in Ryan & Deci, 2000) which is a natural process of internalising and assimilating social norms, such as the thinness ideal, and is associated with intrinsic motivation. Psychological need satisfaction postulates that three innate psychological needs (competence, autonomy, and relatedness), yield enhanced self-motivation and mental health when satisfied. However, these psychological needs lead to diminished motivation and well-being when thwarted (Ryan & Deci, 2000), which could lead to an increased sense of failure in an obese population that fails to maintain satisfactory weight loss.

In terms of restricting food intake, guilt as a mechanism for change in eating behaviours has been identified as being strongly associated with engaging corrective strategies for past transgressions (Conradt, Dierk, Schlumberger, Rauh, Hebebrand, & Rief, 2008), and is therefore considered a motivator for dietary restraint. However, Kuijer and Boyce (2013) investigated the role of guilt about specific food types in weight-loss strategies, and found that feeling guilty about a specific food does not lead to reduced consumption of that food or to healthier food choices being made, but it does instead lead to negative feelings about perceived self-control making the individual less likely to lose weight. Furthermore,

Rozin (2005) proposed that messages relating to specific food types being "bad" were unhelpful, and that it may be more beneficial to adopt the French approach to food whereby there are no "bad" foods, but everything is eaten in moderation. Given that obesity surgery candidates have a long history of failed weight loss attempts (Gibbons et al., 2006), it can be expected that this cohort will associate more food types with guilt and will therefore feel more out of control and less able to take responsibility for their calorie balance.

Traditional weight reduction interventions based on diet and exercise tend to be largely unsuccessful for the obese in the long term (Aphramor & Gingrass, 2008; Wilding, 2007; Jain, 2006; Ogden, 2003). Weight-loss surgery is recommended for severely obese people (BMI>40kg m^2) who have failed to achieve weight-loss with traditional interventions (CG43 Obesity: NICE Guidelines, 2007). Candidates presenting for weight-loss surgery usually have an extensive history of dieting and weight cycling, usually beginning in adolescence, which have failed to halt the on-going weight gain (Gibbons et al., 2006). The incidence of weight-loss surgery performed on the NHS has increased year on year in line with the increase in prevalence of obesity (H.M. Government, 2004). In March 2006 weight-loss surgery for children also became available on the NHS in the UK.

A cost effectiveness study in 2003 (Fang, cited in Joyal, 2004) found weight-loss surgery to be cost effective for the treatment of severe obesity, and evidence suggests that weight-loss surgery has a high degree of clinical efficacy (Wilding, 2007; Mamplekou, Komesidou, Bissias, Papakonstantinou, & Melissas, 2005; Sjöström et al., 2004; Matthews, 2003). The most commonly performed bariatric procedure, the gastric bypass, usually leads to a weight loss of approximately 30% of initial weight and this loss tends to be maintained for a period of around 10 years (Wadden, Sarwer & Williams, 2006). However, many

improvements to eating behaviour wane over time and patients are not equally successful in terms of maintaining weight-loss (van Hout, Jakimowicz, Fortuin, Pelle, & van Heck, 2007), and the reason for this is unknown.

Weight-loss surgery candidates may perceive that responsibility for the outcomes of the surgery lie with the practitioner, and so may adopt a passive role in the weight-loss process. However, Van Hout et al. (2003) argue that optimal weight-loss surgery outcomes require a lifetime commitment to lifestyle change, and that the patient needs to be psychologically healthy and motivated. This places the responsibility for the success of the weight-loss surgery with the patient, and psychological factors must be addressed as they are implicated in post-surgical weight gain (Delin et al., 1995).

There are a number of studies examining some psychological aspects of obesity surgery (Burgmer et al., 2007; Ogden et al., 2006), but there are few examining obesity surgery in the light of subjective well-being, so the current programme of study will incorporate examining this to establish psychological correlates of subjective well-being that help or hinder weight-loss following obesity surgery.

Subjective Well-being

Subjective Well-being (SWB) covers the whole range of well-being, both positive and negative; it tends to be relatively stable over time, and is concerned with the internal subjective experiences of an individual (Diener, Suh & Oishi, 1997). SWB differs from traditional measures of psychological health in that it takes account of personal life satisfaction and global happiness, rather than the identification of symptoms that represent deviations from the accepted norm for psychological health. However, individuals reporting psychopathology in terms of depression, anxiety and poor self-esteem also tend to report low SWB. It is a heterogeneous category that includes diverse phenomena such as optimism which relates to adaptive coping strategies, positive affect which is associated with protective psychosocial and behavioural factors, and life satisfaction (Diener & Chan, 2011).

SWB is a growing dynamic construct that is used widely in applied psychological health and clinical settings (Frisch, 2000) because of the interaction between mind and body. Mental health is more than the absence of mental illness (Keyes, 2007), so both positive and negative affect should be taken into consideration, particularly as positive and negative affect produce independent effects when controlling for the other (Steptoe, Dockray, & Wardle, 2009). Vigorous attempts have been made to measure the construct and measures are being refined. SWB is a comprehensive construct that taps into personality, cognition and dynamics, and demonstrates sound psychometric properties across a range of applications (Pervin, 2003), although there is no single defining measure of SWB.

Diener et al. (1999) suggests that research in the field of SWB should focus on the interaction between internal factors, such as personality, and external circumstances, along with cognitive coping strategies and adaptation to change. Situational factors influence SWB

and may cause levels to fluctuate but eventually they return to base line measures. Kozma, Stone and Stones (1997) argue that this phenomenon is due largely to stability in personality factors overriding situational factors.

Rozanski and Kubzansky (2005) identified a bi-directional relationship between physical health and SWB, with the symptoms of physical ill-health making people vulnerable to impaired psychological health and reduced SWB, and those with poorer SWB vulnerable to impaired physical health and poorer recovery from illness. Furthermore, Ryff, Deinberg Love, Urry, Muller, Rosenkranz et al., (2006) identified distinctive biological correlates for well-being and negative affect including depression, anxiety and anger, with those vulnerable to these conditions reporting poor general well-being. At the other end of the spectrum, Childa and Steptoe (2008) found that positive well-being was related to lower mortality rates in both healthy and diseased populations, and Diener and Chan (2011), found that high SWB causes better health and longevity. Indeed, they suggested that "it is perhaps time to add interventions to improve SWB to the list of public health measures, and alert policy makers to the relevance of SWB for health and longevity" (Diener & Chan, 2011, p32).

The relationship between obesity and SWB

The relationship between obesity and SWB remains unclear because of apparently conflicting evidence. Subramanian, Kim and Kawachi, (2005) found poor health and unhappiness to be highly correlated, suggesting that SWB would be lower in obese populations than in non-obese populations. However, Diener, Wolsic and Fujita, (1995) found that people in ill-health and those considered physically unattractive (quality of life related symptoms of extreme obesity) often report average, not low levels of SWB, so it is possible that this may also be true for obese people. Previous studies have explored personality in relation to obesity and found heterogeneity of personality traits in the morbidly obese (Macias & Leal, 2002), along with a high degree of novelty seeking behaviour in those unable to lose weight (Arehart-Treichel, 2007). This has implications for SWB because personality factors are elements of SWB. Hassett, Maclean, Peterson, Stuart, Buyske, Park, et al. (2009) found that much of the well-being research in medical literature is not guided by theoretically based and empirically supported concepts such as SWB, but rely instead on a general idea of well-being, which questions the validity of the evidence.

Katsaiti (2012) found that SWB was significantly and consistently negatively affected by obesity, with those with the highest BMI having the poorest SWB. These findings were supported by Clark and Etilé (2011), but they also found that the negative impact of obesity on SWB is reduced when an individual's partner is heavier, suggesting a role for Social Comparison Theory. However in contrast, recent research conducted by Bockerman, Johansson, Saarni, and Saarni (2013), found very limited evidence for any independent influence of obesity on SWB, and concluded that the negative relationship between obesity and SWB previously cited could be explained by the adverse effects of obesity on health and physical functioning.

Obese people may suffer from a number of common obesity related health conditions such as diabetes (Lazar, 2005), coronary heart disease (van Gaal, Mertens & de Block, 2006), joint pain (Vuolteenaho, Koskinen & Moilanen, 2013) and sleep apnoea (Hewitt et al., 2014), all of which may impact on life satisfaction and other factors within SWB. Sleep apnoea tends to occur in severely obese individuals as their weight collapses their airways during sleep and they stop breathing. Left untreated, the presence of unmet sleep needs caused by sleep apnoea often results in irritability and depression (Bixler, Vgontzas, Lin, Calhoun, Vela-Bueno, & Kales, 2005), so could lead to lower SWB in an obese population. However, Nes, Roysamb, Reichborn-Kjennerud, Tambs and Harris (2005) found that genetic effects that positively influence SWB also protect against sleep problems, which indicates that obese individuals with innately higher SWB may be likely to return to normal sleep patterns faster than those with lower SWB during weight-loss.

It is expected that obese people would report lower levels of SWB than non-obese people, due to the well-established discrimination and stigmatisation associated with obesity (Azevedo et al., 2013). Bockerman et al. (2013) concluded that there was a clear need to estimate the relationship between obesity and SWB in cultural contexts, because the strength of the associated stigma would depend on both the prevalence of obesity in that specific sub-group of the population and the social conventions. Therefore it may be that obesity has a stronger negative impact on SWB in an adolescent cohort because obesity is considered less acceptable for that demographic group than in an older demographic group (Farhat et al., 2010) so the social stigma within that sub-group would be stronger. By contrast, the impact of obesity on SWB may be reduced in a bariatric surgery group because although they are severely obese, this is the cultural norm for that demographic group so obesity stigma would be less pervasive within the group (although not outside of the group), and physical

limitations due to severe obesity would also be accepted. Moreover, bariatric surgery patients are likely to feel more empowered and less vulnerable to obesity stigma because they are taking action to become less obese, and this would impact positively on SWB.

Weight-loss and SWB

Weight-loss could have a bi-directional relationship with SWB in obese populations because elements of SWB, such as personality traits, will influence adherence to weight-loss strategies and weight-loss success could influence elements of SWB, such as positive affect.

Traditional weight-loss interventions including diet, exercise or drugs require long term commitment to lifestyle change to be effective over time. This means that the responsibility for success clearly lies with the patient, not the practitioner, and that psychological factors implicated in weight gain need to be addressed. Byrne (2002) suggests that psychological factors implicated in the inability to maintain weight-loss include setting unrealistic goals, poor coping skills and low self-efficacy, all of which are reflected in SWB.

Goals are implicated in SWB in that individuals who set and work toward realistic goals tend to report higher SWB and those who set unrealisable goals, or fail to set goals, tend to report lower SWB (Diener et al., 1999). Furthermore, goals that predict life satisfaction tend to be valued by the culture with which an individual identifies (Cantor & Sanderson, 1999), so steps toward the goal of weight-loss, which is highly prized in current Western society, should lead to improved life satisfaction. However, this may be particularly difficult for an obese population as weight-loss failure has been associated with poor goal-setting (Arehart-Treichel, 2007).

Bocchieri, Meana and Fisher (2002) suggest that adaptation to change and improved quality of life (correlates of SWB) may be the most important determinants in the outcome of obesity interventions, yet there appears to be little empirical evidence to support this hypothesis. Individuals who undergo obesity interventions will have consistent personality

traits that are stable over time and circumstance (Matthews & Deary, 1998), but their external circumstances will change so it is expected that they will need to adapt to cope with the change. It would therefore be of value to assess SWB during a period of weight-loss, to explore the dynamics within SWB that may help or impede weight-loss and maintenance, and the effects of weight-loss on overall SWB.

Bocchieri et al. (2002) found negative psychological symptoms associated with obesity such as depression, anxiety and low self-esteem to be a result of obesity and the associated discrimination and stigma, rather than the cause of obesity. This suggests that a reduction in weight may improve these psychological symptoms. It is further suggested that demographic variance and related expectations may influence SWB for the extreme obese. White, O'Neill, Kolotkin and Byrne (2004) found that extreme obesity had different psychosocial correlates across demographic groups independent of individual BMI, with white females reporting the poorest levels of quality of life when compared to other ethnic groups.

The issue of responsibility for weight-loss success may be reflected in psychological differences between individuals selecting traditional weight-loss interventions and those selecting weight-loss surgeries. Ray, Nickels, Sayeed and Sax (2003) argue that the issue of self-selection reflects personality differences between obese patients seeking surgical treatment and those seeking traditional treatment, such as motivation to lose weight. Bocchieri et al. (2002) reported a higher rate of psychological distress in patients seeking a hospital intervention than those seeking a non-hospital intervention, and they relate this finding to motivation.

Ray et al. (2003) also found that patients with extrinsic weight-loss motivation may be more likely to fail to lose weight, and suggest that this may be linked to self-esteem, self-efficacy and locus of control, all of which are implicated in SWB. Furthermore, Henninger, Whitson, Cohen and Ariely (2012) found that medically complex patients presenting with more than one chronic illness, such as those with obesity-related conditions, tended to exhibit a more external locus of control and were less likely to take responsibility for managing their chronic medical conditions.

In terms of those seeking obesity surgery as a means of weight–loss, findings from previous studies suggest obesity surgery may have psychological implications associated with aspects of subjective well-being in the form of improved quality of life (Schauer et al., 2003), improved lifestyle (Sjöströmet al., 2004), improved mood (Wadden et al., 2001) and improved self-esteem (Burgmeret al. 2007; Csendes et al., 2005). Herpertz et al. (2003) found that psychosocial functioning improved following obesity surgery but Waters et al. (1991) found that post-surgical mental health gains had eroded within two years. This may be related to underlying SWB returning to base line measures. Hsu et al. (1998) suggest that this decline may reflect difficulty in adapting to increased social acceptance, which directly reflects the consideration of adaptation in SWB.

Bocchieri et al. (2002) also suggest that there is a strong link between pre-surgical psychological status and surgical outcome in patients presenting for weight-loss surgery and are calling for a qualitative investigation to determine this relationship. The impact of obesity surgery on subjective well-being has not been the main focus of previous studies, and the current research programme aims to explore subjective well-being in participants electing for obesity surgery, and to monitor fluctuations over time.

The present thesis

This research programme aimed to explore the key psychological factors that mediate SWB in overweight and obese populations, because previous empirical literature on the relationship between SWB and obesity has been limited in scope and has yielded inconsistent findings (Katsaiti, 2012; Clark & Etilé, 2011; Bockerman et al., 2013), and a need to establish the levels of SWB necessary to produce psychological improvements which would impact on physical health has been identified as a public health concern (Diener & Chan, 2011). This area was explored in relation to 2 key populations; a cohort of mainly overweight young women who were being encouraged to moderate their weight with diet and exercise, and a cohort of severely obese people who elected for obesity surgery. These cohorts were chosen because they are representative of the extremities of the obese population, with the young cohort being representative of those at the beginning of the obesity lifestyle and the obesity surgery cohort being representative of those trapped by the obesity lifestyle.

Strategy for the analysis

A mixed methods approach was taken encompassing ideographic, nomothetic and longitudinal data, to embrace the complexity of the phenomena as advocated by Suls and Rothman, (2004). All measures selected for this thesis were chosen because of their empirical validity and functionality, and their sound psychometric properties. Nevertheless, each one was validated in this thesis with reference to reliability, factor structure, measures of dispersion (demonstrating individual differences) and indicators of normality (skewness and kurtosis). The models that were tested within the studies were derived by psychological theory and constructs such as subjective well-being, social comparison theory and the theory of planned behaviour, and by previous empirical research.

Simple relationships at bivariate level were tested by correlations for associations and t-tests for differences, and these facilitated further hypothesis testing. All results reported at $p<0.05$ level are interpreted with caution to allow for Type I errors, and assumptions such as homogeneity of variance are accounted for. Data are also interpreted visually by line graphs to identify trends in mean patterns. Following the findings from independent groups t-tests and zero order correlations, more complex statistical models are built including ANOVA, MANOVA and multiple regression. These allowed the researcher to identify the most robust predictors when controlling for other covariates, and to ascertain effect sizes on outcomes. In addition, a series of more advanced models were built and these included factor models, structural models and path analyses. These allowed more robust findings through factor loadings and path coefficients when controlling for measurement error, thus giving a closer estimation to true scores. All models were tested with reference to a range of conventional fit indices and only substantive correlated errors/residuals suggested by the modification index were applied, and cross-factor loadings were avoided.

Mixed methods were adopted in order to provide a clear narrative for the thesis, and this allowed the nomothetic findings to be illustrated by ideographic qualitative data. A thematic analysis was chosen and data were gathered using repeated unstructured one-to-one interviews which were recorded and transcribed verbatim. A non-directive approach was taken to allow the content to be driven by the participants rather than the researcher, to ensure that the themes that emerged were those most pertinent to the demographic group rather than forcing a fit with psychological theory derived from previous literature. This ideographic data complemented the nomothetic data by personalising the findings and by providing a more complete answer. A further iteration of analysis then took place with the findings from the

qualitative data being tested quantitatively using the robust measures and tests described earlier.

Structure of thesis

The present thesis is in 3 parts, as illustrated in Table 1.1.

Part 1 explored correlates of SWB in adolescent girls who were mainly overweight or obese. *Study 1* sought to test the feasibility and validity and reliability of the SWB measures within the context of a diet and exercise school-based intervention, with a cohort of overweight 14 year old exercise avoidant adolescent girls (*N*=288). Studies 2, 3 and 4 applied the adapted measures to a separate cross-sectional adolescent girl population (*N*=546), comprising 12 year olds at the stage of early adolescence (*n*=130), 14 year olds at the mid stage of adolescence (*n*=269) and 18-19 year olds at the late stage of adolescence (*n*=149). *Study 2* examined the psychological effects of cognitive, behavioural and emotional weight and shape concern on SWB across the groups. A steady increase with age was found in the cognitive and behavioural domains of weight and shape concern, but the emotional domain peaked at mid-adolescence and recovered in late adolescence. Weight and shape concern was found to negatively impact on correlates of SWB, particularly in respect of life satisfaction, physical appearance anxiety, dispositional optimism, self-esteem and neuroticism. *Study 3* compared the means, variances and stability of the constructs at the different stages of adolescent development, and the measures were found to be stable across time, with the exception of physical appearance anxiety which was the defining factor for this cohort and peaked at age 14. *Study 4* examined the combined influence of dispositional optimism and physical appearance anxiety on life satisfaction and self-esteem using structural equation modelling. Dispositional optimism was found to positively impact on life satisfaction and

self-esteem, both directly and indirectly, while physical appearance anxiety was found to be a stronger direct predictor, exerting a negative impact on both outcome variables. Dispositional optimism and physical appearance anxiety combined to explain 51% of the variance in life satisfaction and 73% of the variance in self-esteem.

Part 2 explored correlates of SWB in an obesity surgery cohort, and adopted both an ideographic and nomothetic approach. Because the empirical literature for this population is somewhat piecemeal, a non-directional approach was initially adopted to identify the unique factors influencing SWB in obesity surgery candidates. Studies 5 and 6 utilised thematic analysis of repeated unstructured interviews with a small cohort of obesity surgery candidates (*N*=9). *Study 5* explored demographic factors leading to the decision to undertake obesity surgery and found that candidates had a history of childhood obesity, often associated with trauma, and had internalised the negative connotations associated with obesity stigma. Candidates had an extensive history of weight cycling and perceived obesity surgery as a last resort to manage their weight and regain control of their lives. *Study 6* explored aspects of SWB following obesity surgery and found improvements in psychological function and sexual identity, along with and increases in openness to experience. A need for post-surgical psychological support was identified to aid the process of adaptation and change, and this has implications for clinical practice. *Study 7* explored the dynamics of a married couple over a 3 year period, who had undertaken obesity surgery together. This provided a unique insight into the psychological mechanisms that help or hinder successful post-surgical adaptation. The emotion-laden behaviour patterns that had bound the couple together before surgery hindered post-surgical weight-loss, and became the catalyst for separation and divorce. *Study 8* piloted a quantitative study (*N*=9) comprising the SWB measures used in the adolescent cohort, along with measures of self-efficacy, depression and eating disorders, because the qualitative

findings suggested these would be important factors for an obesity surgery population. Feedback suggested that demographic questions on health, quality of life, and hyperphagia would be a useful addition to the next study. *Study 9* examined SWB in an online obesity surgery sample (*N*=125) and found levels of neuroticism were higher than expected, while levels of physical appearance anxiety were lower than expected. Mean scores on the eating disorders measure indicated a non-clinical sample, but interrogation of the data showed that a significant minority met the threshold for binge eating disorder, and this was negatively associated with surgery satisfaction. Again this has implications for clinical practice. Prevalence of anti-depressant medication use was more than double that of the heaviest general population use, but was associated with positive SWB outcomes, suggesting that use of anti-depressant medication could be used as a proxy for confronting health issues rather than a proxy for depression in this sample. Experience of hyperphagia was widespread and this impacted negatively on life satisfaction. Ideographic data suggested positive post-surgical changes to both health and quality of life that reach beyond the benefits of being physically fitter.

Part 3 brought together the strands of part 1 and part 2 to examine correlates of SWB across the cohorts. *Study 10* compared SWB across 2 female active weight-loss samples (*N*=243); an undergraduate dieting sample (*n*=118) and an obesity surgery sample (*n*=116). Significant differences were found in respect of the student sample having higher extraversion and life satisfaction, along with lower neuroticism and physical appearance anxiety than the surgery sample. Another stark difference was in relation to use of anti-depressant medication, with only 11 students ever having used them compared to 90 surgery participants.

The original contribution to knowledge is in respect of:

- Assessing SWB in a cohort of adolescent girls who are being encouraged to moderate their weight by improving diet and increasing exercise, and comparing this cohort to a non-clinical population of 1st year undergraduate women.
- Exploring the relationship between obesity and SWB in a weight-loss surgery cohort using a qualitative thematic analysis.
- Assessing post-operative SWB in a weight-loss surgery couple using longitudinal qualitative methodology.
- Assessing SWB in a cross-sectional weight-loss surgery cohort in a non-clinical setting using an online quantitative study.
- Identifying key psychological indicators for successful outcomes in obesity surgery candidates.
- Comparing SWB in a dieting student cohort with SWB in an obesity surgery cohort to identify correlates of SWB that mediate obesity or protect against obesity.

Study	Participant descriptors	Research aims	Methodology
Part 1			
1: Preliminary adolescent study	Non-exercising mid-adolescent girls recruited from 22 Liverpool schools. N=288, age 13-14 years.	Test feasibility of SWB measures in an adolescent sample. Assess impact of appearance anxiety of correlates of SWB.	Quantitative survey method.
2: Adolescent appearance anxiety and correlates of SWB	Adolescent girls N= 546. Early adolescents recruited from Liverpool schools. n=130, age 12 years.	Establish impact of physical appearance related emotions, behaviours and cognitions on correlates of SWB.	Cross-sectional quantitative survey method.
3: Adolescent construct stability across developmental changes	Mid adolescents recruited from Liverpool schools. n=267, age 14 years.	Test stability of measures across early, mid and late adolescence.	
4: SWB correlates data modelling	Late adolescents recruited from LJMU. n=149, age 18-19 years.	Predict impact of physical appearance anxiety and optimism on life-satisfaction and self-esteem.	
Part 2			
5: Demographic factors leading to obesity surgery	Obesity surgery candidates recruited from wlsinfo.org. N=9, age 34-54 years. 6 females, 3 males.	Identify demographic factors leading to obesity surgery.	Qualitative thematic analysis method. Data collected via repeated unstructured interviews conducted at 6 monthly intervals over 18 months.
6: Impact of obesity surgery on correlates of SWB		Examine post-surgical changes to correlates of SWB.	
7: Obesity surgery couple	N=2, wife aged 39 years; husband aged 34 years at first point of contact.	Examine dynamics of personal relationships that can help or hinder the weight-loss process over time.	Longitudinal qualitative thematic analysis method. Interviews conducted annually over 3 years.
8: Pilot obesity surgery study	As per studies 5 and 6	Test feasibility of SWB measures in an obesity surgery sample.	Quantitative survey method.
9: Obesity surgery study	Obesity surgery candidates recruited from wlsinfo.org. N=125, age 25-59 years, mean age = 42. 116 females, 9 males.	Identify impact of surgery on SWB and a range of factors including quality of life and anti-depressant use.	On-line cross-sectional quantitative survey method.
Part 3			
10: Comparative weight-loss study	Dieting females N=234. Students, n=116, age 18-19 years, surgery patients, n=118, age 18-19 years.	Identify areas of similarity and difference across the cohorts.	On-line cross-sectional quantitative survey method.

Table 1.1: Conceptual plan of thesis

Chapter 2

Subjective well-being in adolescence

SWB is considered to be comprised of 3 domains; positive affect (the frequency of positive emotions such as happiness), negative affect (the frequency of negative emotions such as anger), and perceived quality of life. While the domains are related and may impact on each other, they represent distinct constructs and should be measured as such (Diener at al., 1999).

Adolescent subjective well-being has been associated with a stable family home, successful friendships and a sense of personal significance (Astedt-Kurki, 2005). High life-satisfaction, the cognitive component of SWB, is related to good adaptation, optimal mental health and positive development in adolescents (Park, 2004). Furthermore, positive cognitive beliefs about oneself in adolescence have been found to be related to healthy lifestyle choices, with those who have stronger confidence in their own ability being more likely to embed appropriate diet and exercise behaviours into their lifestyle (Melnyk, Jacobson, Kelly, O'Haver, Small & Mays, 2009).

Positive affect in adolescence can mitigate the negative effects of stressful life events (Park, 2004), like those associated with obesity. SWB has also been found to mediate relationships between the environmental experiences of youth and problem behaviours (Huebner, Suldo, Smith, & McKnight, 2004), so is important in helping to alleviate the negative psychological outcomes associated with obesity in adolescence, such as an increased 'irritability' or 'bad temper' when compared to healthy weight peers, which may be a response to social stigma and bullying (Fonseca, Matos, Guerra & Gomes-Pedros, 2010).

Prevalence of obesity in adolescence

The greatest recent increases in obesity in children and adolescents have been in the United States and Western Europe (Wang & Lobstein, 2006), with a higher prevalence of obesity in England than the US at ages 2-5 years, but a higher prevalence in the US than England by adolescence (Lang, Kipping, Jago & Lawlor, 2011). The prevalence of overweight and obese adolescents, typically aged between 12 and 19 years, has tripled in the US since 1980 (Ogden, Carroll, Curtin, Lamb & Flegal, 2010), with more than one third of children and adolescents in the US being overweight or obese by 2010 (Ogden, Carroll, Kit, & Flegal, 2012), a trend that is likely to be replicated in the UK. However, this increase in prevalence may be slowing down as Olds, Maher, Zumin, Peneau, Loiret and Casterbon (2011) found that the prevalence of overweight children in 9 countries, including the US and across Europe, has recently stabilised, but this still leaves a large proportion of children vulnerable to developing obesity in adolescence and adulthood.

Adiposity is increasing in children generally (Hendriks, Gubbels, De Vries, Seidell, Kremers, & Jansen, 2012) and this places them at greater risk of becoming obese adults, as childhood obesity has been found to be the strongest predictor of obesity 5 years later (Salbe et al., 2002, cited in Crothers, Kehle, Bray, & Theodore, 2009). Greater adiposity is observed among specific racial and ethnic minority adolescent groups, putting them at greater risk of becoming overweight or obese than their white counterparts (Ogden et al., 2010). Children from low-income households appear to be particularly vulnerable to obesity, irrespective of ethnicity (Crothers, et al., 2009), a factor that is likely to be related to the availability of calorie dense cheap processed foods. Girls are more at risk of gaining fat as adolescents, while boys gain fat later in adulthood (Eiben et al., 2005) so girls will be the focus of the adolescent aspect of this study.

Increase in prevalence of obesity among adolescents in the UK

In the UK the prevalence of obesity among children and adolescents has continued to raise over the past decade despite targeted government strategies to reduce obesity levels. The prevalence of overweight and obesity in children and adolescents in England rose significantly between 1995 and 2004, and this increase has been identified as a major public health concern (Evans & Seligman, 2005).

In Scotland, the proportion of children classed as overweight has risen to 30.6% in 2012, in spite of the proportion of girls doing the recommended levels of physical activity having increased to 68% and the reported time spent doing sedentary activities such as watching TV or using a computer having decreased (BBC Scotland, 2013).

There has also been an increase in overweight and obesity levels in England, with combined rates of overweight and obesity in children in year 6 (age 10-11) having increased to 33.9% in 2012 (The Information Centre for Health and Social Care, 2012), and combined rates of overweight and obesity in adolescents aged 11 – 15 years having increased to 35.7% in 2011 (National Obesity Observatory, 2013).

The fastest increase in the prevalence of overweight and obese children and adolescents occurred between 1995 and 2004, and thereafter the increase seems to have slowed somewhat, but the prevalence is still increasing, but at a slower rate, so it remains a major cause for concern (Health Survey for England, 2013).

Factors that can lead to obesity in adolescence

Familial factors have been implicated in obesity in adolescence, with adolescents whose parents are obese being at a greater risk of becoming obese than adolescents with average sized parents (Arehart-Treichel, 2007; Crothers et al., 2009). Overweight adolescents are also more likely to become obese adults than those of a healthy adolescent weight (Wang, Chyen, Lee, & Lowry, 2008), and this is an on-going issue with the prevalence of men (12%) and women (20%) being obese at age 20 in 2010, being double of that 14 years earlier (Vlassopoulos, Combet & Lean, 2013).

Exercise is a factor that protects against obesity in adolescence, but adolescence is also a time of significant decrease in physical activity (Crocker & Sabiston, 2006). Lack of exercise in adolescence is associated with poor social skills, lack of social support, and impaired well-being (Dierk, Conradt, Rauh, Schlumberger, Hedebrand, & Rief, 2006) and is significantly implicated in an increased risk of obesity in adolescence. Furthermore, life satisfaction in adolescence is found to be positively correlated with exercise (Frisch, 2000). These findings suggest that adolescent girls who fail to engage in regular exercise may be prone to gain weight and be susceptible to appearance anxiety and poor psychological function, which may impact on SWB.

Sleep also appears to be a factor in childhood and adolescent obesity with those who have less than 10 to 11 hours sleep per night being at a significantly greater risk of becoming obese (Snell, Adam, & Duncan, 2007). However, with the changing patterns of adolescent media use and an increased popularity of online computer gaming and social network sites accessed from android phones, adolescents are reporting spending more than 7.5 hours per day accessing online media (Brown, & Bobkowski, 2011), so many adolescents are having

diminished amounts of sleep because they are continuing to engage with these devices in their bedrooms at times when they need to be sleeping.

Consumption of fast food and sugar sweetened soft drinks has been associated with obesity (Andersen et al., 2005), particularly in children and adolescents (Hector, Rangan, Louie, Flood, & Gill, 2009), but consumption continues due to the cognitive dissonance associated with the pleasurable taste outweighing the deferred consequences (Freeman & Sheiham, 1997), so a number of obesity reduction interventions targeted at this population have been implemented. These interventions have focussed on reducing the amount of soft drinks consumed by limiting availability (Hawkes, 2010), increasing price (Chirqui, Chaloupka, Powell, & Eidson, 2013; Fletcher, Frisvold, & Tefft, 2010) and educating adolescents on the impact of consumption (Kassem, Lee, Modeste, & Johnston, 2003).

The findings on the efficacy of the interventions to reduce soft drink consumption in young people are mixed, with the conclusion that the removal of soft drinks from schools may not reduce overall consumption (Terry-McElrath, O'Malley, & Johnston, 2013) because further evidence suggests that consumption then becomes greater in the home environment (Sloviter, 2008). Price increase led to a reduction in consumption but education had little impact (Block, Chandra, McManus, & Willett, 2010). Despite the inconclusive evidence on the efficacy of individual interventions, efforts to reduce soft drink consumption in adolescents were found to slow overall weight gain (Wolff, & Dansinger, 2008). However, successful attempts to reduce consumption of high calorie soft drinks and fast food may have a negative impact on the affective states of adolescents because Chang and Nayga (2010) found that although children who consumed more fast food and soft drinks are more likely to be overweight, they are less likely to be unhappy than their peers who consume a healthy

diet. This has implications for well-being in an adolescent population where a healthy lifestyle is being promoted.

Adolescence is a period whereby social, emotional and physical changes to the body can increase negative self-perception (Crocker & Sabiston, 2006) and this can be further mediated by being overweight or obese. Nguyen-Rodriguez, Unger and Spruijt-Metz (2009) concluded that a cluster of negative psychological states associated with cognitive arousal, including stress, worries and anxiety, induced emotional eating in adolescent girls, which then put them at risk of becoming overweight or obese. They therefore suggested that obese adolescent girls would benefit from learning stress-reduction techniques to reduce emotional eating.

Quest for thinness

There is a strong consensus in the literature that the prevailing sociological zeitgeist in western society is the quest for thinness in physical appearance (Levine, & Smolak, 2010; Suisman, O'Connor, Sperry, Thompson, Keel, Burt, et al., 2012; O'Dougherty, Schmitz, Hearst, Covelli, & Kurzer, 2011) which is difficult for the majority of people to achieve (Dittmar, 2007). Owen and Laurel-Seller (2000) examined the body measurements of Playboy centerfolds between the 1960's and the 1990's and found that there was an increasing thinness to such an extent that many of the models in the 1990's would meet the criteria for Anorexia Nervosa. However, many of the models attained a curvaceous body type due to surgical enhancements. They found this to be replicated in internet models, many of which are directed towards adolescent females and feed the continued quest for thinness.

This quest for thinness is particularly strong in media directed towards adolescent girls which normalises dieting and excessive thinness and encourages girls to evaluate their own bodies against the thin ideals (Harrison & Heffner, 2008). This influence at the macro level may be translated at the micro level into the internalisation of thinness ideals, which are seen as norms (Warren, Gleaves, Cepeda-Benito, Fernandez, Mdel & Rodrigues-Ruiz, 2005) that are strongly associated with body dissatisfaction (Grabe, Ward, & Hyde, 2008) and are associated with appearance esteem to some degree for women across all ethnic groups (Sabik, Cole & Ward, 2010).

Kraig and Keel (2001) found girls rated both overweight and average-weight children more negatively than they rated a thin child, thus, for girls the salient category was thinness, suggesting that ideals of thinness are so prevalent for girls that even being average weight is undesirable. The social mind-set of the thin ideal is embedded in childhood with above average

weight characters in television sitcoms being socially marginalised (Robinson, Callister & Jankoski, 2008) leading children to devalue and stigmatise peers with above-average body weights (Latner, Rosewall & Simmonds, 2007), making them less well-liked and having fewer friendships (Zeller, Reiter-Purtill, & Ramney, 2008). Furthermore, Valente, Fujimoto, Chou and Spruijt-Metz (2009) found that overweight children and adolescents were more likely to have overweight friends rather than healthy weight friends, reinforcing the notion that this marginalised group suffered discrimination.

In direct contrast with the literature suggesting that overweight children have few friends and friendship groups comprised of mainly children from other socially disadvantaged groups, Reiter-Purtill, Ridel, Jordan and Zeller (2010) found that overweight children and adolescents have an equivalent number of healthy weight friends within their peer group, which may protect them from appearance related stigma and anxiety. Furthermore, Price (2009) reported that obese teenagers can learn to accommodate a larger body in their schemata and consequently report satisfaction with their appearance.

The stigma of obesity can lead to adolescents missing school to avoid being bullied which can in turn lead to poor educational attainment, so schools should take the necessary steps to prevent this form of prejudice (Pyle, Sharkey, Yetter, Felix, Furlong, & Poston, 2006). Overweight or obesity has been found to be a strong factor in high school dropout (De Ridder, Pape, Johnsen, Holman, Westin & Bjorngaard, 2013) and obese people have been found to have completed fewer years of education than lean people (Gortmaker, Must, Perrin, Sobol & Dietz, 1993). Boeka and Lokken (2008) reported that obese individuals had impaired cognitive function, irrespective of medical co-morbidity, and this was echoed by Yu, Han, Cao, and Guo (2008) who found that an obese population had lower IQ than an equivalent non-obese

population, however the difference was null after adjusting for education, suggesting that the difference may be caused by poor education rather than impaired cognitive abilities per se. However, this phenomenon of poor educational attainment in obese populations fuels the stereotype of obese people being less intelligent than thinner people, which further increases the stigma of obesity.

Psychological implications of failure to meet the thin ideal

Psychological theory explains the dynamics of the process in this context through a Social Comparison Model (Neighbors & Sobal, 2007), whereby individuals compare themselves favourably or unfavourably with models either slimmer or fatter than themselves. Adolescent women are particularly vulnerable to comparing themselves negatively with the slim female models presented in the media (Morrison, Kalin & Morrison, 2004; Ogden & Mundray, 1996) and feel the pressure to conform (Vogt Yuan, 2010).

The problem of trying to conform with the thinness ideal can be exacerbated by a distorted perception of weight, which can in turn trigger unhealthy weight management behaviours (Ursoniu, Putnoky, & Vlaicu, 2011; Chang & Christakis, 2003) because body weight perception represents a potential mediator between BMI and unhealthy weight control behaviours (Dong-Sik, Youngtae, Sung-II & In-Sook, 2009). Therefore, added to the personal negative self-evaluation that can come through comparisons with others, is the distortion of one's own weight and shape. Schneider, Frieler, Pfeiffer, Lehmkuhl and Salbach-Andrae (2009) found that a healthy adolescent weight control group consistently overestimated their body size, and Smeesters, Mussweiler, and Mandel, (2010) reported that females with a healthy BMI were most susceptible to being negatively affected by exposure to very thin models.

From another stand point, psychological theory attempts to explain the differences between the ideal self and the actual self through Self-Discrepancy Theory (Higgins, 1987). Individuals may be motivated to reduce the differential but this may reflect body image disturbance through either body weight or shape dissatisfaction or both, and the greater the distance from the ideal the higher the levels of dissatisfaction (Heron, & Smyth, 2013; Thompson & van Den Berg, 2002). However, Krayer, Ingledew and Iphofen (2008) found that

some adolescents coped by discounting images that were perceived as threatening by distancing themselves from them. This coping mechanism could be extended by providing opportunities to assimilate non-traditional images of beauty in school-based interventions.

Petrie and Greenleaf (2011) found that significant others commenting on size and weight can contribute to adolescents engaging in unhealthy eating and exercise behaviours, and according to Pajaujiene and Jankauskiene (2012), adolescents who internalised the social body thinness ideals most rigorously were more dissatisfied with their appearance and engaged in more maladaptive eating and exercise patterns than those who did not internalise the social ideals. Furthermore, this type of externally motivated weight-loss behaviours has been negatively associated with psychological outcomes (Carraça, Markland, Silva, Coutinho, Vieira, Minderico et al., 2011).

The impact of body dissatisfaction is pervasive and has been associated with lowered self-esteem (Johnson & Wardle, 2005), increased dieting behaviours (Markey & Markey, 2005), depression (Sjoberg, Nilsson, & Leppert, 2005), unhealthy weight control behaviours (Thogersen-Ntoumani, Ntoumanis, Cumming, & Chatzisarantis, 2011) and avoidance of physical activity (Anton, Perri, & Riley, 2000). For young adolescent girls a large aspect of their self-esteem may be encapsulated within their perception of self-image, which in turn is embodied in their perception of body weight and shape. However, it is possible to overcome the negative effects of the thin ideals by classically conditioning these images with synonyms of 'fake' (Martijn, Sheeran, Wesseldijk, Merrick, Webb, Roefs et al., 2013) and by appearance acceptance training (Atkinson, & Wade, 2012), which should be incorporated into school-based interventions.

Conforming to the cultural norm in terms of body shape for young women also has its limitations because it attracts attention to the body and away from the face, which leads the perceiver to objectify the person which leads to depersonalisation (Loughnan, Haslam, Murnane, Vaes, Reynolds, & Suitner, 2010). This in turn dehumanises the young woman and she is perceived to be less intelligent, and to have lower moral worth and competence than the observer (Vaes, Paladino, & Puvia, 2011). Gervais, Vescio and Allen (2012) found that women who deviated from the thin idealised body type were equally objectified and were perceived as interchangeable with their thin counterparts, however, Holland and Haslam (2013) found that there were significant differences in objectification of young women based on body size, with overweight young women benefitting from being objectified less than their thin counterparts, and being also attributed with more intelligence and moral agency. The overweight young women were therefore subjected to less of the harmful effects of objectification, demonstrating a clear psychological benefit to being overweight. However, adolescence is typically a time where young women are actively seeking attention from potential suitors and they may not have developed the skills required to discriminate between positive and negative attention, so the benefits associated with reduced objectification could be lost.

The strong relationship between obesity and depression has been widely reported (de Wit et al., 2010), and it has been hypothesised that obese people become depressed due to social stigma and obesity related physical health factors (Schafer, & Ferraro, 2011). However, Roberts and Duong (2013) found that specifically among adolescents, the relationship was unidirectional, with depressed adolescents being at a greater risk of becoming obese, but obesity having no impact on developing depression.

The inverse association between socio-economic status (SES) and weight that is well established for women in adulthood now extends to children (Shrewsbury & Wardle, 2008), with the poorest being the most likely to be obese. In addition, excess weight confers social disadvantage in overweight adolescent girls who experience poorer income and employment prospects than lean adolescent girls (Gortmaker, Must, Perrin, Sobol & Dietz, 1993), further increasing the socio-economic discrepancies associated with obesity. However, the prevalence of obese children in lower SES groups seems to be mediated by obesity in parents, with no difference found between SES groups in prevalence of overweight children with lean parents, but a significant difference found between SES groups in prevalence of overweight children with obese parents, with those in the lower SES groups having a greater proportion of overweight children. (Semmler, Ashcroft, van Jaarsveld, Carnell, & Wardle, 2009). This highlights the role played by parents in facilitating obesity in children, and perhaps points to discrepancies in the stigma associated with obesity, with it being considered more acceptable within obese communities.

Impact of obesity in adolescence

Adolescent obesity is consistently associated with both poor psychological and social functioning. Obesity in adolescence has been found to be associated with a range of poor psychological outcomes. Previous research has indicated that adolescent girls are particularly susceptible to appearance related anxiety (O'Dea, 2006), with those who are obese reporting more negative physical perceptions of themselves and lower self-worth than their average weight peers (BeLue, Francis, & Colaco, 2009; Pyle et al., 2006). For young women in western societies, being overweight is often equated with being "ugly" (Chrisler, 2012), rendering them more susceptible to bullying and victimisation. Zametkin et al., (2004) found that obese adolescents report more sadness, loneliness and anxiety than their healthy weight peers in addition to more emotional and behavioural problems. Furthermore, Fonseca, Matos, Guerra, and Gomes-Pedro (2010) found these issues to be replicated with overweight adolescents. Forste and Moore (2012) examined the association between body weight and life satisfaction in adolescents and found lower life-satisfaction among adolescent girls that are overweight and obese, relative to healthy weight adolescent girls, and that most of the negative association operates through perceptions of self, peers, parents, and school. These findings suggest that obese adolescent girls may be prone to appearance anxiety and poor psychological function, which may impact on subjective well-being.

Adolescent obesity is also strongly associated with poor psychological functioning and is a strong predictor of depression in adolescent females (Boutelle, Hannan, Fulkerson, Crow, & Stice, 2010), is a risk for subsequent anxiety disorder (Anderson, Cohen, Naumova, Jacques, & Must, 2007) and is significantly associated with low self-esteem (McClure, Tanski, Kingsbury, Gerrard, & Sargent, 2010). The direction of the associations between these variables is unclear as both stress and low self-esteem have been found to be significant

predictors of depressive mood in obese or overweight adolescents (Martyn-Nemeth, & Penckofer, 2012). Health-related quality of life is also significantly poorer in obese children and adolescents than in healthy-weight counterparts (Tsiros, Olds, Buckley, Grimshaw, Brennan, Walkley, et al., 2009).

Social stigma related to peer-pressure and conformity has a strong association with obesity in adolescence. Obese or overweight children (Lumeng, Forrest, Appugliese, Kaciroti, Corwyn, & Bradley, 2010) or adolescents (Farhat, Iannotti, & Simons-Morton, 2010) are more likely to experience peer victimization and stigma than their healthy weight counterparts. The social stigma that obese youths face is pervasive and can have serious consequences for emotional and physical health (Puhl, & Latner, 2007). The impact of social stigma is evident in schools with obese children having higher levels of school absenteeism and subsequent poorer academic performance than their healthy weight peers (Bethell, Simpson, Stumbo, Carle, & Gombojav, 2010). Being overweight in adolescence also has a significant effect on psychosocial functioning with those in an overweight category reporting a poorer perception of their academic performance than those in a healthy weight category, irrespective of actual performance (Fonseca, Matos, Guerra, & Gomes-Pedro, 2010).

Adolescent obesity also carries significant physical health implications with a higher risk of a wide range of illnesses including Type II diabetes, various cancers and cardio-vascular illness (Office of the Surgeon General, 2010). Obese adolescents are more likely to have pre-diabetes, a condition in which blood glucose levels indicate a high risk for development of diabetes (Li, Ford, Zhao, & Mokdad, 2009). Freedman, Zuguo, Srinivasan, Berenson and Dietz (2007) conducted a population-based study with a sample of 5 to 17 year-olds and found that 70% of obese youth already had at least one risk factor for

cardiovascular disease. Taking health risk factors into account, Franks, Hanson, Knowler, Sievers, Bennett and Looker, (2010) predicted that obese children would be vulnerable to premature death in later life, which could lead to children having a shorter life-expectancy than their parents because of the prevalence of obesity (Olshansky, Passaro, Hershow, Layden, Carnes, Brody, et al., 2005).

Intervention to reduce the psychological implications of obesity

The persistent nature of the association between being overweight and poor emotional well-being suggests that overweight adolescents are unlikely to spontaneously recover their emotional well-being as they mature into adulthood, so appropriate interventions to improve psychological functioning should be implemented (Loth, Mond, Wall, & Neumark-Sztainer, 2010).

A systematic review of school-based interventions targeting obesity related concerns found that the role of psychological theories and behavioural or cognitive mediators were rarely investigated (Safron, Cislak, Gaspar, & Luszczynska, 2011), suggesting a deficit in knowledge. Moreover, Calderon, Forns and Varea (2010) recommended that obesity prevention programmes for young people should incorporate measures of physical appearance anxiety to prevent anxiety becoming a fixed personality trait.

Regular exercise has been commended as a protective factor from body dissatisfaction (Duncan, Al-Nakeeb, Nevill, & Jones, 2004), which can result in physical appearance satisfaction and an increase in healthy eating behaviours (Gehrman, Hovell, Sallis, & Keating, 2006). This is particularly beneficial for those with the greatest body dissatisfaction and weight or shape concerns, as they experience the most significant satisfaction following a period of physical exercise (Vocks, Hechler, Rohrig, & Legenbauer, 2009). However, recent research has suggested that the benefits of physical exercise on body satisfaction are subject to individual differences with the weakest effect on those with either a high BMI or a strong tendency to compare their appearance with others (Fuller-Tyszkiewicz, Skouteris, & McCabe, 2013).

Leisure time physical activity and depressed mood have been found to covary inversely through adolescence (Birkeland, Torsheim, & Wold, 2009), suggesting psychological benefits gained from exercise may extend beyond body satisfaction. However, the extent to which the psychological benefits associated with exercise impact across areas of life is unknown, and no association was found between exercise and school-based stress (Gerber, & Pühse, 2008). Apart from the benefits to SWB, other benefits in exercise include improved friendships and health (Hausenblas, Brewer, & Van Raalte, 2004), and the latter includes prevention of heart disease, control of cholesterol and diabetes, slower bone loss and slower risk of certain cancers (USDHHS, 2001).

In spite of the well documented benefits of exercise, LePage, Crowther, Harrington and Engler (2008) have concluded that "exercise may be associated with both positive and negative consequences" (p.424). Exercisers may have a higher drive for thinness (Zabinski, Calfas, Gehrman, Wilfley, & Sallis, 2001), a higher degree of body focus (Davis & Fox, 1993) and their self-esteem may be more dependent on physical appearance than non-exercisers (Davis, Fox, Cowles, Hastings, & Schwass, 1990). Exercise may become pathological if the individuals exercise to the "obligatory" point of pain and to the extent that it disrupts social life (Polivy, Herman, & McFarlane, 1994), with women who report high identification with exercise and place a high value on having an athletic physique being most vulnerable to obligatory exercise (Karr, Zunker, Thompson, Sherman, Erickson, Cao, et al., 2013).

In women who regularly exercise, obligation to exercise has a greater negative impact on affect and cognition than exercise absence (LePage, Price, O'Neil, & Crowther, 2012) and a key factor is whether exercise is pursued as a "compensatory behaviour" to compensate for overeating or for appearance (LePage, Crowther, Harrington, & Engler, 2008). Women who

exercise to preserve or enhance physical appearance can be motivated by feelings of shame, defectiveness or perfectionism and are susceptible to eating psychopathology (Meyer, Blissett, Alberry, & Sykes, 2013). These findings suggest that while moderate exercise tends to have positive outcomes, excessive exercise can have negative psychological outcomes, so any intervention to increase exercise uptake in adolescents should be carried out sensitively to prevent exercise becoming a maladaptive behaviour.

Adolescent sport participation is lowest for girls in deprived areas and for those who are obese (Mandic, Bengoechea, Stevens, Leon de la Barra, & Skidmore, 2012), with a potential barrier to exercise being weight criticism (Brownell, Schwartz, Puhl, Henderson & Harris, 2009) and Social Physique Anxiety (SPA). SPA is the fear of being negatively evaluated in relation to physical appearance (Hart, Leary & Rejeski, 1989). It is common in young adolescent females preoccupied with body weight and shape, and is a key factor in sustaining body image disturbance and dissatisfaction, and may be associated with eating disorders (Asci, Tüzün, & Koca, 2006). Atalay and Gencoz (2008) assert that "previous research confirms that social anxiety is a common element of all forms of body image disturbance" (pp. 178/9), and add that people with high SPA aim to impress others and fear negative evaluation. Anxiety is engendered in situations where the body is open to the public gaze (Diehl, Johnson, Rodgers, & Petrie, 1998), such as when playing sport, and the likely consequence is avoidance (Smith, 2004).

Chapter summary

To conclude, the prevalence of overweight and obesity in children and adolescents is continuing to rise (Health Survey for England, 2013) despite successful government interventions to increase physical activity (BBC Scotland, 2013). The prevalence of the thinness ideal within society has increased in line with obesity rates (Levine, & Smolak, 2010) and the interaction of these two factors has resulted in an increase in the associated social stigma for obese adolescents (Fonseca, et al., 2010).

The stigma associated with being overweight can lead to negative psychological outcomes such as appearance anxiety (O'Dea, 2006), depression (Sjoberg, et al., 2005) and low self-esteem (Johnson, & Wardle, 2005) and can impact on the ability to form and maintain friendships (Zeller et al., 2008). These psychological issues are unlikely to dissipate as the adolescent matures into adulthood (Loth et al., 2010), so appropriate interventions should be put in place that take both psychological and behavioural aspects into account (Safron, et al., 2010).

Correlates of SWB can provide a protective factor in mitigating the negative effects of the stigma of obesity (Melnyk et al., 2009), so should be considered in terms of a psychological intervention to address appearance anxiety and maladaptive cognitions. Behavioural interventions could consider both diet and exercise as they can help with the physical aspects of obesity and provide a positive psychological outcome (Vocks et al., 2009), but excessive exercise can be as harmful to appearance anxiety as obesity (LePage et al., 2012) and negative experiences of dieting can lead to feelings of hopelessness, so a moderate intervention that introduces novel foods and low impact activities may be most beneficial.

STUDY 1

Adolescent cohort preliminary study

A preliminary study was conducted to explore subjective well-being in exercise avoidant adolescent girls who took part in a National Lottery funded health promotion event based on improving diet and increasing exercise, along with gaining knowledge and understanding of the causes and implications of being overweight or obese for an adolescent cohort. The design of this event was based on the fundamental model of psychosocial interventions (PSI), defined as treating or preventing chronic healthcare conditions using educational, behavioural and cognitive approaches (Sharman, 2012). Melnyk et al., (2009) suggest that this type of intervention, incorporating both healthy lifestyles and mental health outcomes, can benefit adolescents both in terms of reducing obesity and improving mental health. Moreover, Atkins, Hoagwood, Kutash and Seidman (2010) proposed the integration of approaches to promote both learning and health in schools to improve adolescent well-being.

The intervention aimed to provide a fresh approach to diet and exercise which included being introduced to a range of exercise activities not usually offered in a school environment (Yoga, Pilates, Rock Climbing and Jazzercise) and being given tasters of appetising healthy food, such as fruit smoothies and vegetarian wraps, to encourage weight management and promote physical exercise. This was designed as a one-off event to challenge negative perceptions of exercise and healthy eating due to previous poor experiences or social conditioning and to provide an alternative perception of beauty to encourage the girls to become more self-accepting. It was expected that personal development tutors and mentors at school would continue to work with the girls following this event.

Given that it is possible to overcome the negative effects of the thin ideals by appearance acceptance training (Atkinson, & Wade, 2012), participants also took part in a Body Beautiful session which comprised of a motivational workshop based on activities to raise awareness, understanding and acceptance of different body types. As overweight and obese adolescents cope with their physical appearance anxiety by discounting media images perceived as threatening (Krayer et al., 2008), the workshop involved using media images in a different way to identify positive non-traditional images of beauty to provide an alternative form of beauty that the adolescent girls could identify with. This was combined with elements of mindfulness involving teaching the adolescent girls to trust present moment experiences, which is known to have a positive effect on sense of control and psychological health in relation to eating (Kristeller, & Hallett, 1999, cited in Hoffman, 2010). This method was selected because mindfulness training has direct positive effects on self-esteem and significantly predicts self-esteem and life-satisfaction (Pepping, O'Donovan, & Davis, 2013), which are mediating factors to reduce social anxiety (Rasmussen, & Pidgeon, 2011), so could reduce physical appearance anxiety in adolescent girls. Moreover, mindfulness-based training has been successfully adapted for use with adolescents to improve well-being by increasing self-awareness, self-efficacy and self-compassion (Burke, 2014).

This workshop is where the girls also completed validated measures comprising correlates of SWB, along with open worksheets relating to appearance anxiety and body image. The appearance anxiety measure was included because adolescent girls are particularly susceptible to appearance related anxiety (O'Dea, 2006). They also answered 5 yes/no questions to assess cognitive, behavioural and emotional responses to their own appearance, and it was predicted that girls who endorsed each of these positively would also endorse the positive SWB constructs at a higher level and the negative SWB constructs at a lower level.

The girls were also required to complete an evaluation of the intervention, to assess the impact and effectiveness of the day. This was open-ended and non-directional, to allow participants to be open in their evaluations and to provide feedback that demonstrated what was meaningful to the participants rather than meeting the expectations of the facilitators. This data was used to inform the content of subsequent interventions and to establish the relevance of the intervention to the participant cohort.

The research aims of this study were: (i) to test the feasibility of the SWB measures with an adolescent sample and (ii) to assess the impact of appearance anxiety on factors of SWB. In respect of the second aim, it was hypothesised that participants who endorse negative cognitive, behavioural and emotional responses to physical appearance will score significantly lower on positive correlates of SWB and significantly higher on negative correlates of SWB than participants who endorse positive cognitive, behavioural and emotional responses to appearance anxiety.

Method

Participants

A targeted opportunity sample of school girls (N = 288) took part. They were in school year 9, aged 13-14 years; they were mainly overweight and were all exercise avoidant to the extent that they had repeatedly taken steps to avoid Physical Exercise (PE) classes in school. Year 9 students were chosen because they are at an age when participation in school sport activities declines rapidly along with an increase in body image concerns (Women's Sport & Fitness Foundation, 2013). The participants were recruited from 22 high schools across Liverpool, by being identified by their PE teachers as problematic in some way. The schools formed part of the Liverpool Sports Partnership.

Design

A quantitative survey method was used to establish group norms for this cohort across correlates of SWB comprising positive affect (dispositional optimism, extraversion), negative affect (neuroticism) and cognitive appraisal of life satisfaction, along with physical appearance anxiety.

A between participant design was employed, with 5 dichotomous questions relating aspects of appearance anxiety forming the grouping variables. The content of these questions relate to cognitive, behavioural (internally regulated and externally regulated) and emotional (positive and negative) aspects of appearance perception. The dependent variables were the correlates of SWB. It was predicted that positive endorsement of each of the dichotomous questions would be associated with endorsement of the positive aspects of SWB at a higher level and endorsement of the negative aspects of SWB at a lower level.

Because this was a preliminary study, a qualitative aspect was also employed in respect of establishing the main drivers for appearance anxiety in a non-exercising adolescent cohort, along with a non-directive an open evaluation of the project.

Materials

A booklet of measures was created to assess correlates of SWB and appearance anxiety in an adolescent cohort, as detailed below and shown in appendix 2D.

Life Orientation Test - Revised (LOT, Carver & Scheier, 1985).

This measure was designed to test general dispositional optimism, including individuals' beliefs about positive outcomes. Optimism has been found to have good psychometric properties including predictive validity and the reliability obtained from this study was: Cronbach's Alpha = 0. 624. This is a 7-item measure with a 5-point Likert response format, ranging from 1 = Strongly Disagree to 5 = Strongly Agree. Scores can range from 7 (low optimism) to 35 (high optimism), and the mid-point of the scale is 21. A few items on this measure are reversed and higher scores suggest greater dispositional optimism. Examples of items in this measure; 'In uncertain times, I usually expect the best', and 'I hardly ever expect things to go my way.'

Satisfaction with life scale (SWLS, Diener et al., 1985).

This measure was designed to test general life satisfaction. Life satisfaction has been found to have good psychometric properties including predictive validity and the reliability obtained from this study was: Cronbach's Alpha = 0. 0.789. This is a 5-item measure with a 7-point Likert response format, ranging from 1 = Very Strongly Disagree to 7 = Very Strongly Agree. Scores can range from 5 (low life-satisfaction) to 35 (high life-satisfaction), and the mid-point of the scale is 20. None of the items on this measure are reversed and higher scores suggest

greater life-satisfaction. Examples of items in this measure; 'In most ways my life is close to my ideal', and 'If I could live my life over, I would change almost nothing.'

The Five Factor Model (Costa & McCrae, 1985).

This measure was designed to test the 5 broad personality traits; openness, conscientiousness, extraversion, agreeableness and neuroticism. The focus of this study is limited to the domains of extraversion-introversion and neuroticism-emotional stability, which represent the positive and negative affective states relating to personality and SWB. However, the remaining traits will also be examined to provide norms for an adolescent cohort. There are a number of variants of the five factor model available, but the one selected was chosen because it is brief and less wordy than the alternatives, which makes it more appropriate for an adolescent sample. This measure is well established in the empirical literature and the reliability obtained in this study is: Openness - Cronbach's Alpha = 0.651, Conscientiousness - Cronbach's Alpha = 0.811, Extraversion - Cronbach's Alpha = 0.816, Agreeableness - Cronbach's Alpha = 0.795, and Neuroticism - Cronbach's Alpha = 0.788. The measure is comprised of 5 items for each personality factor that is measured on a semantic differential scale ranging from 1 to 9. The minimum possible score for each factor is 5 (e.g. low extraversion) and the maximum possible score is 45 (e.g. high extraversion), and the mid-point of the scale is 25. Higher scores represent strong endorsement of the specific personality factor. Examples of items in this measure; 'Unimaginative-Imaginative' for openness, 'Disorganised-Organised' for conscientiousness, 'Silent-Talkative' for extraversion, 'Timid-Bold' for agreeableness, and 'Relaxed-Tense' for neuroticism.

Physical Appearance State and Trait Anxiety Scale, (PASTAS, Reed et al., 1991).

This measure was designed to test trait physical appearance anxiety, including individuals' general feelings of anxiety, tension and nervousness about their physical appearance. The validity of the PASTAS is well established and the reliability obtained in this study is: Cronbach's Alpha = 0.856. This is a 16-item measure with a 5-point Likert response format, ranging from 0 = Not at all to 4 = Exceptionally so. Scores can range from 0 (no anxiety) to 64 (extreme anxiety), and 32 is the mid-point of the scale. Higher scores are indicative of higher physical appearance anxiety and no items are reversed. Examples of items in this measure; 'The extent to which I look overweight' and 'My thighs.' The trait version of the PASTAS was used in order to tap stable underlying responses and for valid comparison with the other trait-like measures in the study.

Dichotomous Questions

In addition, 5 dichotomous (yes/no) appearance-related questions were devised by the researcher based on previous research findings, to align with the psychosocial intervention model (PSI), tapping into behavioural (both positive and negative), emotional (both positive and negative), and cognitive domains, in relation to appearance self-appraisal. These are detailed below:

1. *Do you think the way you look will affect your future happiness?* This represents the *cognitive* domain associated with appearance and measures the extent to which the current beauty ideals have been internalised. This is associated with appearance esteem (Sabik et al., 2010).
2. *Have you ever been bullied because of your appearance?* This represents an *externally motivated behaviour* in response to outside influences, which have been associated with

negative psychological outcomes (Carraça et al., 2011), and also reflects experience of the stigma associated with not attaining the cultural ideal of beauty.

3. *Have you ever been on a diet to change your appearance?* This represents self-regulating *internally motivated behaviour* for change to meet cultural ideals (Ursoniu et al., 2011), and also reflects dissatisfaction with current appearance.
4. *Do you feel guilty about eating?* This represents a *negative emotion* associated with food, weight and size to conform to societal pressures (Vogt Yuan, 2010), and also reflects societal pressures to avoid certain food groups.
5. *Are you happy with your appearance?* This represents a *positive emotion* associated with appearance.

Open worksheets: Mirror, mirror what do I see?

Open worksheets, devised by the researcher which relate to one's own body image, were used to mediate self-perception and prompt positive change. These focused on 3 areas: what they like about themselves, what they would like to change and how they would like to make the changes (see appendix 2E).

Evaluation

Workshop evaluation materials comprised of 3 open-ended questions: what was good today, what could have been better today and what was learned today (see appendix 2F).

Procedure

The 45 minute Body Beautiful workshop designed to promote self-acceptance and tolerance of alternative forms of beauty was structured in small segments to keep the girls on task (see appendix 2C). Participants were put into small groups of 20, which were further

subdivided into 4 groups of 5 participants, and they remained with their peer group for the duration of the intervention. This was to encourage peer interaction and support as this is known to be a strong motivator for change within the PSI model (Sharman, 2012).

Data was collected during a Body Beautiful session which was an integral part of the health promotion intervention. This session comprised of 3 stages; preliminary data collection, intervention, and consolidation.

During the initial data collection phase, participants completed validated measures of correlates of SWB comprising dispositional optimism, life satisfaction and the five factor model of personality, along with a measure of trait physical appearance anxiety. They were also asked to answer 5 dichotomous questions about their subjective experience of their appearance. They were supported in this by a research assistant being present at each table of 5 participants. The research assistant further explained the measures and answered any questions, and scribed for participants who found the exercise difficult because of inadequate literacy skills or poor functional English. They also ensured that the participants were respectful to each other and this made the exercise fully inclusive.

Participants then took part in the intervention, where they were taught about the strategies used by the advertising industry to create artificial images that were impossible to replicate in real life. They were then provided with information on genetic somatotypes (Carter & Honeyman Heath, 1990) and encouraged to re-evaluate and appreciate their own bodies in the light of this new information. They then created a group poster about positive body image to provide an informal platform for discussion with support from the research assistants (see appendix 2G for an example). This exercise required participants to find non-traditional images of beauty in

magazines and media publications to create an alternative perspective of beauty that they could relate to. The posters were displayed at the end of the day to create a 'graffiti wall' for all to see and to create further discussion.

Finally, the participants completed open worksheets relating to their own body image focusing on what they like about themselves, what they would like to change and how they would like to make the changes (see appendix 2E), to consolidate the learning during the intervention. A workshop evaluation was also carried out to determine the impact of the intervention on the adolescent girls (appendix 2F).

Ethical considerations

Ethical issues related to the participants being minors and the content of the research being sensitive. The issue of participants being minors was addressed by the school teachers being present and accepting responsibility for the participants throughout the day, and by research assistants being Criminal Records Bureau (CRB) checked.

Participation in data collection was voluntary and participants were made aware of their right to withdraw their data at any point. Signed consent was sought from every participant and sustained efforts were made to ensure that participants understood the details of the research. Research assistants were on hand throughout the session to answer any questions that arose. Although the nature of the research involved obesity, participants were not asked to divulge their weight because this could lead to further stigmatisation and bullying. Instead they were assumed to be 'unfit' because they were actively avoiding PE.

The content was approved by the Liverpool Schools Sports Partnership and ethical approval was granted by Liverpool John Moores University Research Ethics Committee.

In addition, participants completed a workshop evaluation to establish the usefulness of the intervention from the perspective of the participant. This was completed anonymously and the results were reported to the Liverpool Schools Sports Partnership along with the research findings.

Results

Descriptive Statistics

The descriptive statistics shown in Table 2.1 demonstrate that the data were normally distributed, with scores for both skewness and kurtosis being small across all the measures.

Table 2.1: Descriptive statistics for the four self-report measures

	Mean	SD	Range	Skewness	Kurtosis
LOT	22.18	3.85	10-34	-0.96	0.40
SWLS	25.09	5.70	5-35	-0.82	0.70
PASTAS	36.61	11.36	9-64	0.11	0.03
O	33.30	5.88	8-45	-0.63	0.79
C	30.93	8.12	5-45	-0.56	-0.18
E	34.96	7.24	5-45	-0.92	0.94
A	36.84	5.98	15-45	-0.91	0.91
N	22.98	8.76	5-45	-0.11	-0.38

LOT = Life Orientation Test, SWLS = Satisfaction with Life Scale, PASTAS = Physical Appearance State and Trait Anxiety Scale, O = Openness, C = Conscientiousness, E = Extraversion, A = Agreeableness, N = Neuroticism.

As expected, the mean scores for dispositional optimism (LOT), life satisfaction (SWLS), physical appearance anxiety (PASTAS), openness (O), conscientiousness (C), extraversion (E), and agreeableness (A) were in the positive parameters, just above the mid-point of the scales, the standard deviations were appropriate for the number of items in each measure, and most of the scale was used in each measure. The mean score for neuroticism (N) was close to the mid-point of the scale, and although it was in the negative parameter, it was greater than would be expected on an adult sample, and this may be as expected for a hormonal adolescent sample.

Correlations

In relation to the correlates of SWB presented later in Table 2.2, it was expected that the associations would be weakly to moderately correlated with each other, thus showing both their overlap and independence. Optimism (LOT) and life satisfaction (SWLS) were expected to be correlated positively with each other and extraversion, and negatively with physical appearance anxiety (PASTAS) and neuroticism. It was also expected tentatively that conscientiousness would be positively associated with the well-being variables, given that it is deemed to be a regulatory variable.

Table 2.2: Correlation coefficients for self-report measures

	LOT	SWLS	PASTAS	O	C	E	A	N
LOT	.63	.50**	-.24**	.12**	.25**	.16**	.14**	-.28**
SWLS	.	.79	-.24**	.06	.30**	.27**	.20**	-.27**
PASTAS		.	.86	-.23**	-.25**	-.10*	-.17**	.20**
O			.	.65	.37**	.40**	.36**	-.10*
C					.81	.33**	.49**	-.15**
E						.81	.36**	-.16**
A							.80	-.05
N								.79

**p<.05, ** p< .01. SWLS = Satisfaction with Life Scale, LOT = Life Orientation Test, PASTAS = Physical Appearance State and Trait Anxiety Scale. Reliabilities are shown in the diagonals.*

As expected, the correlations were moderate and positive across the measures, with the exception of neuroticism and physical appearance anxiety, which were negatively correlated with the other measures and positively correlated with each other. The strongest correlation was between dispositional optimism and life satisfaction (.50, p<.01), suggesting that participants

who showed high life satisfaction also had an optimistic outlook on life. Again, this is as expected and demonstrates consistency across the measures.

Inferential statistics

The five dichotomous questions assessing the extent to which current beauty ideals have been internalised leading to body dissatisfaction, along with experience of appearance related social stigma and associated emotions were used to measure the impact across the correlates of SWB. In relation to the five dichotomous (yes/no) questions, it was expected that the girls who endorsed each of these positively (not dieted to change appearance; not feeling guilty about eating; not bullied because of appearance; looks would not determine future happiness; happy with appearance) would also endorse the positive constructs at a higher level (optimism, life-satisfaction and extraversion), and the negative constructs at a lower level (physical appearance anxiety and neutoticism). Significant results emerged in 16 of the 25 tests, and the trends were consistent in these directions. It should be noted that equality of variance was assumed in all cases except for life satisfaction (p>0.05), but the correction was applied. The findings are shown in table 2.3.

In terms of norms for this cohort, almost half of the girls were unhappy with their appearance (48%) and believed that their appearance would affect their future happiness (47%), and reported feeling guilty about eating (42%), almost a third (29%) had experienced appearance related bullying, and just over half (55%) had already dieted to lose weight. Overall, this points to high levels of appearance concern for this cohort across the 3 domains.

Analysis revealed that cognitive, behavioural and emotional factors impact across correlates of SWB for this cohort, particularly in respect of life satisfaction which generated statistically significant differences across all domains, although effect sizes were moderate. Significantly higher life satisfaction is found in girls who do not believe that their appearance will affect their future happiness (d = .45), who have not been bullied because of their

appearance (*d* = .47), who have not been on a diet (*d* = .36), who do not feel guilty about eating (*d* = .44), and who are happy with their appearance (*d*= .36).

Physical appearance anxiety was also impacted by the factors and generated statistically significant differences across all domains except for externally motivated behaviour. Significantly higher physical appearance anxiety was found in girls who believe that their appearance will affect their future happiness (*d* = .40), who have been on a diet (*d* = .50), who feel guilty about eating (*d* = .48), and who are unhappy with their appearance (*d* = .79).

Emotional responses to appearance seemed to have the greatest impact on SWB for both negative and positive emotions. Girls who reported feeling guilty about eating (42% of cohort) were significantly less satisfied with life (*d* = .44), more anxious about their appearance (*d* = .48), more introverted (*d* = .24), less emotionally stable (*d* = .56), and more pessimistic (*d* = .39), than girls who didn't feel guilty about eating. Girls who reported being happy with their appearance (49% of cohort) were significantly more satisfied with life (*d* = .36), less anxious about their appearance (*d* = .79), more emotionally stable (*d* = .34), and more optimistic (*d* = .44), than girls who were unhappy with their appearance. Further analysis revealed that emotional responses to appearance anxiety accounted for 68% of the variance in this cohort.

The externally regulated behavioural response to appearance seemed to have the smallest impact on SWB, with girls who reported being bullied because of their appearance (30% of cohort) being significantly less satisfied with life (*d* = .47) and less optimistic (*d* = .31) than those who had not been bullied. These findings suggest that external behavioural factors have limited impact on the internal traits of extraversion and emotional stability, along with trait physical appearance anxiety for this cohort. This could be because girls who would be most

susceptible externally regulated behaviours would be unlikely to be in this non-exercising cohort (Carraça et al., 2011).

Table 2.3: Independent measures t-test results for correlates of SWB in relation to 5 dichotomous questions

Independent variables are shown in columns and dependent variables are shown in rows.

N=287	Q1	Q2	Q3	Q4	Q5
Yes n	134	84	158	120	139
No n	153	203	127	167	146
SWLS	**-2.84*** **	**-3.50*** **	**-3.34** **	**-3.92*** **	**2.84** **
Cohen's *d*	.45	.47	.36	.44	.36
Mean Yes	*24.25*	*23.66*	*23.28*	*23.70*	*26.06*
Mean No	*26.15*	*26.11*	*25.85*	*26.31*	*24.19*
PASTAS	**-4.61*** **	**-4.52*** **	**-1.56**	**-3.29*** **	**6.22*** **
Cohen's *d*	.50	.48	.20	.54	.79
Mean Yes	*39.94*	*39.08*	*37.28*	*38.64*	*32.83*
Mean No	*33.94*	*33.14*	*35.00*	*34.30*	*40.66*
LOT	**-1.03**	**-3.12** **	**-1.56**	**-1.32**	**2.78** **
Cohen's *d*	.16	.31	.13	.17	.44
Mean Yes	*21.97*	*21.38*	*21.39*	*21.86*	*22.82*
Mean No	*22.44*	*22.77*	*22.51*	*22.46*	*21.57*
Extraversion	**-0.81**	**-2.02***	**0.96**	**-2.16***	**1.06**
Cohen's *d*	.02	.24	.08	.26	.13
Mean Yes	*35.27*	*33.95*	*34.33*	*33.95*	*35.43*
Mean No	*34.58*	*35.69*	*35.23*	*35.8*	*34.53*
Neuroticism	**3.56*** **	**4.56*** **	**1.35**	**1.73**	**-2.48** **
Cohen's *d*	.22	.56	.12	.13	.34
Mean Yes	*24.59*	*25.68*	*24.05*	*23.93*	*21.67*
Mean No	*20.97*	*21.06*	*22.53*	*22.15*	*24.21*

**= p<0.05, ** = p<0.01, *** = p<0.001 ** p < .01. SWLS = Satisfaction with Life Scale, LOT = Life Orientation Test, PASTAS = Physical Appearance State and Trait Anxiety Scale, Q1 = Cognitive domain, Q2 = Externally motivated behaviour, Q3 = Internally motivated behaviour, Q4 = Negative emotion, Q5 = Positive emotion.*

The analyses revealed a trend that cognitive, behavioural and emotional approaches to appearance anxiety do have a significant effect on correlates of Subjective Wellbeing. Further analysis revealed that emotional aspects of appearance anxiety (positive and negative affect) had the most significant effect on all SWB correlates.

Participants were asked to complete an open worksheet to explore their physical appearance concerns (see appendix 2E), and the findings demonstrated very poor appearance acceptance (see appendix 2F). They were also asked to complete an evaluation form (see appendix 2G) to determine their perceptions of the intervention, and the results were very positive, suggesting that the intervention was successful (see appendix 2H). Moreover, these outcomes are reinforced by feedback from the organiser of the event, which suggests that many of the objectives of the day were achieved (see appendix 2J).

Discussion

The reported findings in this study provide evidence for the quality of the data elicited with reference to normality of distribution, individual differences in the measures of dispersion, expected associations across the correlates demonstrating commonalities and independence, and sound indicators of reliability across the constructs; optimism, life-satisfaction, openness, conscientiousness, extraversion agreeableness and neuroticism. The measure of dispersion from the mean related to neuroticism indicated that some of the sample endorsed slightly higher levels of this trait and that might be expected for a hormonal adolescent female sample. Thus, the primary aim of testing the feasibility of the SWB measures in an adolescent sample was met.

Physical appearance anxiety proved to be the defining factor for this cohort, with results that suggest that high levels of physical appearance anxiety pervade across this mainly overweight adolescent cohort, and just over half of the girls reported being unhappy with their appearance (52%). These results are unsurprising as adolescent girls are known to be particularly susceptible to appearance related anxiety (O'Dea, 2006), a phenomenon that is exacerbated for obese (Chrisler, 2012) and overweight (Fonseca et al., 2010) adolescents. This provides a theoretical framework for study 3, to establish the stability of physical appearance anxiety and measures of SWB across adolescent groups.

Moreover, there was a perception of power and influence associated with physical appearance for this cohort, with almost half of the girls (47%) believing that their appearance would affect their future happiness, and almost a third (29%) already having experienced appearance-related bullying, perhaps because they were heavier than the desired ideal (Kraig & Keel, 2001). This sense of powerlessness can be explained in terms of the Social

Comparison Model (Neighbors & Sobal, 2007), where the girls compare themselves unfavourably with the thin ideals and feel inadequate (Harrison & Heffner, 2008). This will be further expanded in study 2.

These findings were further supported during the open worksheet activities, where the intervention identifying parts of their body that they 'liked' had to be amended to 'things that I can live with' because the girls struggled to identify anything about their body that they liked (see appendix 2F). Even then, no girl managed to identify more than one feature that she 'could live with'. This self-dislike could reflect an overestimation of body size (Schneider et al., 2009), and suggests that self-esteem may be an important issue for this cohort, so it is included as a separate construct in study 2.

Conversely, the girls found no difficulty in identifying many areas of their body that they would like to change along with ways to make the changes, with 'taking exercise' and 'following a healthy diet' being the most frequently cited methods of making the changes, which was unsurprising as these were themes of the day. Plastic surgery was the next most frequently cited method of making the desired changes, a subject that was not included in any of the activities during the day but emerged from the girls' mental schema around beauty and self-acceptance, which perhaps points to the influence of popular media (Morrison et al., 2004) and the pressure to conform (Vogt Yuan, 2010). As 'plastic surgery' was an unexpected dominant theme that emerged during the intervention, it is included in study 2 for further exploration.

The secondary aim of the research was met as a relationship was found to exist between appearance related anxiety and correlates of SWB in this adolescent cohort, with

those who reported higher levels of appearance anxiety also reporting being significantly less open to experience, more inwardly focussed, less emotionally stable, and less satisfied with life than girls who reported lower levels of appearance anxiety. Thus, the research hypothesis was supported.

The relationships between physical appearance anxiety and correlates of SWB could be a function of the experience of appearance-related adolescent discrimination (Valente, et al., 2009) and provides further support for the inclusion of the PASTAS construct in subsequent studies. Furthermore, significantly higher physical appearance anxiety was found in girls who believe that their appearance will affect their future happiness (d = .40), who have been on a diet (d = .56), who feel guilty about eating (d = .48), and who are unhappy with their appearance (d = .79), providing further support for the relationship between an internalisation of the thinness ideal, appearance dissatisfaction and associated emotions and behaviours (Pajaujiene & Jankauskiene, 2012).

Previous research suggests that obese or overweight adolescents are more likely to experience bullying than their healthy weight counterparts (Farhat et al., 2010) and that this can have serious consequences for emotional and physical health (Puhl, & Latner, 2007). The prevalence of appearance-related bullying was high in this adolescent cohort, with almost a third of the girls (29%) reporting being a victim. However, this seemed to have limited impact on SWB, with those who had been bullied reporting significantly poorer life satisfaction (d = .47) and less optimism (d = .31) than those who had not been bullied, but no difference in the internal traits of extraversion and emotional stability, or in trait physical appearance anxiety. This limited impact could be because girls who would be most

susceptible externally regulated behaviours would be unlikely to be in this non-exercising cohort (Carraça et al., 2011). This will be further examined in subsequent studies.

Although descriptive statistics for life satisfaction, the cognitive component of SWB, were positive, individual differences were found in relation to the belief that appearance will affect future happiness (d = .45), appearance-related bullying (d = .47), dieting (d = .36), feeling guilty about eating (d = .44), and being happy with appearance (d = .36). This supports the previous findings of Forste and Moore (2012) and points to the impact of body weight on life satisfaction in adolescent girls and the role of perceptions of self and peers, along with the likelihood of adopting appropriate diet and exercise behaviours (Melnyk et al., 2009). This provides a theoretical framework for Study 2.

The normal distribution of data and expected measures of central tendency and dispersion demonstrates that the measures were understood by the girls and they cooperated fully. However, some participants found it difficult to stay on task to complete the questionnaires and found the numbers off-putting because they felt they were being judged. There were also negative associations with mathematics. The numbers in the Likert scales were therefore replaced by a series of smiley faces in subsequent studies to make the measures more user-friendly for an adolescent cohort.

The evaluation of the intervention (see appendix 2H) suggests that the workshop was appropriate, enjoyable and accessible for many of the girls. Furthermore, responses to the evaluation suggest that the intervention was in part successful because the girls learned to 'love themselves' (57), to 'think positive' (54) to 'be confident with who they are' (34) and to 'be happy with who they are' (32) suggesting that they were becoming more accepting of

their body, which should lead to increased satisfaction with their appearance (Price, 2009). Themes of the day were adopted with girls reporting that it is better to eat healthily and to exercise rather than to try a weight-loss diet, many of which fail in the long-term. There was also evidence of a shift in attitudes towards body image with some girls learning to like their body (21), along with an acceptance of different body types (19) and the acknowledgment beauty comes in arrange of sizes (17). This provides evidence that this approach is appropriate for adolescent data collection in subsequent studies.

Dissemination

The findings from this study were presented in poster format at the British Psychological Society Annual Conference in Dublin, April 2008, and at the Institute for Health Research Conference in Liverpool, May 2008 where it received a prize for best poster research. More importantly, the key findings were presented to the Liverpool Sports Partnership so that the learning from this intervention could be applied across schools in Liverpool.

Chapter 3

Obesity and Subjective Well-being across Stages of Adolescent Development

Adolescence is a period of rapid physical cognitive and social-emotional development. For girls at the beginning of adolescence (typically age 11-13 years), physical change includes breast and hip development and the onset of menstruation, cognitively their focus on the present, emotionally they may experience rapid mood changes, and behaviourally there is a shift in focus with the peer group becoming more influential. By mid-adolescence (typically age 14-18 years), physical puberty is completed, cognitively they have developed the capacity for goal setting, emotionally they may be very self-involved, alternating between high expectations and poor self-concept, and behaviourally there is a drive for independence. Finally, by late adolescence (typically age 18-19 years), the girls are physically fully developed, cognitively they have an increased concern for the future, they have increased emotional stability and their behaviour demonstrates in increased concern for others (American Academy of Child and Adolescent's Facts for Families, 2008). These physical, cognitive and social-emotional changes will impact on weight and shape concern, particularly for girls prone to becoming overweight, and the focus of this chapter is to examine the impact of adolescent development on subjective-wellbeing.

In this chapter, studies 2, 3 and 4 combine to form an extended research programme, and each use the same methodology and cohort to examine 3 different aspects of the research. The cohort includes 3 separate groups of young women to represent early-adolescence (age 12 and at the beginning of the period of hormonal changes to the body), mid-adolescence (age 14 and at the peak of hormonal changes to the body), and late-adolescence (age 18-19 and at a stage where hormonal changes should have settled).

Research programme with extended adolescent cohort

Given that young adolescence is a vulnerable time for negative impression formation in females (Bas, Asci, Karabudak, & Kiziltan, 2004), this research programme is aimed at two groups (12 and 14 year olds) who had opted out of school exercise to partially replicate and extend study 1. Moreover, both groups are compared with 18-19 year old female university freshers.

The research programme looks for differences and similarities in the constructs highlighted in study 1 and the literature, especially self-esteem (Rosenberg, 1965) and physical appearance anxiety (Reed, Thompson, Brannick, & Sacco, 1991). Although the research programme is not longitudinal and therefore does not examine mean change over time, it does test mean differences in self-reported responses with the expectation that self-esteem will be lower and body image anxiety higher in the 14-year olds, as this age reflects the transitional period when female adolescents become more acutely aware of their weight and shape (Asci et al., 2006). With reference to these findings, a negative correlation is expected between self-esteem and physical appearance anxiety.

Within the design of this research programme, self-esteem is set as a potential outcome of physical appearance anxiety, given that body image perception is paramount in young female adolescents. The study will also test if physical appearance anxiety is associated with life satisfaction with reference to Diener, Emmons, Larsen and Griffin's (1985) Satisfaction with Life Scale (SWLS). Self-esteem and satisfaction with life are factors associated with perception of well-being and these are examined with references to means and variances, in their association with physical appearance anxiety and in their association with each other.

The role of personality is also examined within this chapter, specifically the two factors most strongly associated with well-being; extraversion and neuroticism. Butkovic, Brkovik and Bratko (2012) suggest that adolescence is a critical period of personality development in respect of well-being, and that personality (extraversion and neuroticism) explained more variance in well-being in adolescents than in older adults, and that it explained more variance in eudaimonic (cognitively-based) than hedonic (affectively-based) aspects of well-being.

Another construct that has emerged in the empirical health literature related to well-being is dispositional optimism (Seligman, 2008), and in this research programme it is measured through the Life Orientation Test – LOT (Carver & Scheier, 1985). Optimism is typically used as an associate of health and well-being related outcomes because it is deemed to encapsulate motivation, coping and control (Seligman, 2008), and Kowalski, Mack, Crocker, and Fleming, (2006) have argued that the management of social physique anxiety has not been addressed in relation to coping and emotion theory.

In the current research, optimism is tested alongside the physical appearance anxiety to ascertain its relationship with self-esteem and satisfaction with life. Phillips and Pitman (2007) found that low optimism was associated with diffuse-avoidant identity (assessed within the context of well-being) in two samples of adolescents, aged between 11 and 20, although they only used one item to measure optimism. The present study provides more extensive content validity by using a more comprehensive measure of optimism, and it was expected that LOT would be negatively associated with PASTAS and positively associated with S/EST and SWLS.

The younger groups in this study (12 to 14 year olds) had opted out of all school exercise programmes, and many had weight-related problems whilst others were vulnerable to such

problems. The schools involved in these studies requested the researchers to provide the young people with activities that would engage them in facing up to their weight, exercise and image-related problems following the success of the outcomes of study 1. This was intended to be the beginning of a reorientation in beliefs, perceptions and practices for the young people.

As age 14 is typically the age at which female participation in school exercise programmes drop off (Women's Sport & Fitness Foundation, 2013), the Liverpool Schools Sports Partnership who commissioned the event, hoped that by delivering the intervention at age 12 it would provide a prophylactic against this behaviour becoming entrenched at age 14, therefore the 2 exercise resistant cohorts were selected.

For the researchers an important goal was to ascertain if psychological measures/constructs would assist in eliciting image-related problems and suggest measures around which future interventions could be monitored. It was also important to ascertain the extent to which psychological issues associated with adolescent physical appearance anxiety have been resolved in early adulthood, so a comparison was made with 18-19 year old female undergraduate students.

In the research programme two similar exercise avoidant groups are compared at two ages that represent an important transitional and vulnerable period at the outset of adolescence. Both groups are young females in the same catchment areas who opted out of school exercise programmes, and this study highlights the potential effects of key psychological dimensions that may impact on the impression formation that emanates from this transitional period. The two groups were tested on two indicators of well-being (self-esteem and satisfaction with life) and were compared on all measures with first year undergraduate females in their later adolescence.

Because the study is cross-sectional, direction of causal flow cannot be dogmatically inferred. Nevertheless, the direction and strength of the relationship between the constructs may be suggestive of key variables that impact on well-being for young adolescent females.

Study 2 has a focus on the dichotomous questions and examines the extent to which cognitive, behavioural and emotional aspects of weight and shape concern affect the participants psychologically at the different stages of development. Study 3 examines the means, variances and stability of the constructs at the different stages of development. Study 4 models the data to predict future behaviour.

Method

Participants

The sample consisted of three young female groups (N = 546) which were comprised of 12-year old students at year 8 (n = 130), 14-year old students at year 9 (n = 267) and 18/19 year old undergraduate psychology students in the first year of their psychology degree (n = 149). The two younger teenage groups were drawn from 22 schools in the North West of England who were part of the Liverpool Schools Sports Partnership. The schools selected the girls for a one day intervention to promoting healthy eating and exercise behaviours because they refused participation in all school-based exercise programmes. This was a targeted opportunity sample whereby any girls taking part in the activity could choose to also take part in the study. The undergraduate sample was also a targeted opportunity sample, with the inclusion criteria being female and aged between 18 and 19. The students volunteered to participate in the study in return for credit points to be used for acquiring participants for their own research projects.

Design

This was a cross-sectional survey method in which participants responded to five validated self-report measures along with 6 dichotomous yes/no questions relating to appearance. Initial hypotheses were explored with reference to the three groups in the study as the independent variable and the five self-report measures as the dependent variables. Hypotheses were then explored further by multiple regression models through which dispositional optimism (LOT) and physical appearance anxiety (PASTAS) were postulated as associates that may impact on self-esteem (S/EST) and satisfaction with life (SWLS).

Materials

A booklet of measures was created to assess correlates of SWB and appearance anxiety in an adolescent cohort. The validated measures were largely the same as in study 1 (see pages 53-55), namely the *Life Orientation Test - Revised* (LOT, Carver & Scheier, 1985), the *Physical Appearance State and Trait Anxiety Scale* (PASTAS, Reed et al., 1991), the *Satisfaction with Life Scale* (SWLS, Diener et al., 1985), and *Five Factor Model* (Costa & McCrae, 1985). These measures are widely used and well established in research literature, with a high reliability in this study of: LOT Cronbach's Alpha = 0. 86, SWLS Cronbach's Alpha = 0.86, PASTAS Cronbach's Alpha = 0.89, Extraversion Cronbach's Alpha = 0.87, Neuroticism Cronbach's Alpha = 0.87. In addition, self-esteem was assessed as detailed below.

Self-esteem (Rosenberg, 1965).

This measure was designed to test general self-esteem, including the respondents estimation of their own self-worth and self-value compared to others with their own subjective perception. Self-esteem has been found to have good psychometric properties including predictive validity and the reliability obtained from this study was: Cronbach's Alpha = 0.91. This is a 10-item measure with a 5-point Likert response format, ranging from 1 = Strongly Agree to 5 = Strongly Disagree. Scores can range from 10 (low self-esteem) to 50 (high self-esteem), and the mid-point of the scale is 30. Five items are reverse-scored to prevent an automated response and higher values reflect higher self-esteem across the measure Examples of items in this measure; 'I feel that I have a number of good qualities', and 'At times I think I am no good at all.'

In addition to the validated measures, 6 dichotomous (yes/no) appearance-related questions were devised by the researcher based on previous research findings, to align with the

psychosocial intervention model (PSI), tapping into behavioural (both positive and negative), emotional (both positive and negative), and cognitive domains, in relation to appearance self-appraisal. These are as devised for study 1, with the addition of *would you consider plastic surgery to improve your appearance?* This represents the *cognitive* domain associated with appearance and was included because of the high number of participants in study 1 who selected this as their primary method of making desired changes to their appearance. This was the third most popular choice after exercise and healthy eating, both of which were to be expected as they were key themes of the day. Moreover, recent data from the American Institute of Plastic Surgeons (2013), demonstrates that the proportion of adolescents aged 13-19 undergoing plastic surgery increased by 5% in 2012 to 236,356 procedures. These procedures include traditional surgical procedures such as breast augmentation (8,204 cases) and less invasive procedures such as Botox injections (17,447 cases), and point to an increased awareness of and access to plastic surgery as a means of changing appearance. Although this data relates to adolescents in America, trends appear to be similar across the USA and the UK (the Guardian, 2012), so the proportional increase is likely to be similar for the UK.

Given that participants in Study 1 found the numbers in the measures off-putting, these were replaced with a series of smiley/sad faces and all non-essential writing was removed to make the booklet more appealing to the young participants (appendix 3C: Smiley Face Questionnaire Booklet – LOT, Big 5, SWLS, Dichotomous Questions, PASTAS, Self-esteem Scale).

Procedure

The study with the school girls (2 groups) was a National Lottery sponsored (UK) event that arose out of concern from the schools about young adolescent girls who opted out of regular school exercise programmes. Twenty two schools in the North West of England mandated the

researchers to conduct 2 one-day interventions; one for the 12-year olds and one for the 14-year old students. Because the outcomes of study 1 were positive, both for the girls and the schools, the one-day events followed the same general format as that of study 1.

This study was not designed as an intervention per se but as a first step toward engaging the young people with facing up to the future challenge of exercise engagement, emotional regulation and self-esteem enhancement. During the course of the day the self-report measures were presented and the young people were given as much time as they needed to complete the exercises. Supervisors were on hand to guide the participants through the process and to assist them with wording issues. Moreover, the young people were requested to evaluate the usefulness of their day's activities. This was done anonymously and there was an overwhelming consensus among them that the awareness day had been beneficial.

In addition, a group of female undergraduate psychology students completed the same self-report measures and these results facilitated testing the stability and invariance of the measures across the female adolescent groups. Although the undergraduates were not designated as non-exercisers, this age group of college women is renowned for anxiety over body image (Anton et al., 2008).

Ethical considerations

As with study 1, ethical issues related to two groups of participants being minors and the content of the research being sensitive. The issue of participants being minors was addressed by the school teachers being present and accepting responsibility for the participants throughout the day, and by research assistants being Criminal Records Bureau (CRB) checked.

Participation in data collection was voluntary and participants were made aware of their right to withdraw their data at any point. This was explained both verbally an in written form (appendix 2A: Participation Information Sheet). Signed consent was sought from every participant (appendix 2B: Informed Consent Form) and sustained efforts were made to ensure that participants understood the details of the research. Research assistants were on hand throughout the session to answer any questions that arose.

Undergraduate students who took part did so in return for credits points to be used for acquiring participants for their own research projects and their consent was completely voluntary. They were fully informed about the nature of the research, in both verbal and written format (appendix 3A: Student Participant Information Sheet) and provided signed consent (appendix 3B: Informed Consent Form) which was not witnessed by a third party because they were adults. Undergraduate participants generally had a greater understanding of the constructs because they were psychology students, so fewer research assistants were on hand to support completion. As with the younger cohorts, undergraduate participants were fully debriefed and had the opportunity to ask any questions that arose.

The content was approved by the Liverpool Schools Sports Partnership and ethical approval was granted by Liverpool John Moores University Research Ethics Committee. In addition, participants completed a workshop evaluation to establish the usefulness of the intervention from the perspective of the participant. This was completed anonymously and the results were reported to the Liverpool Schools Sports Partnership along with the research findings.

Data reliability and validity

The descriptive statistics shown in Table 3.1 demonstrate that the data were normally distributed, with scores for both skewness and kurtosis being small across all the measures. Additionally, reliability is demonstrated with high Cronbach's α scores.

Table 3.1: Cronbach's α, Skewness and Kurtosis for the six dimensions of self-report measures

	Cronbach's α	Skewness	Kurtosis
LOT	0.89	-.478	-.356
SWLS	0.86	-.485	-.338
PASTAS	0.89	-.015	.173
S/EST	0.91	-.567	-.029
E	0.87	-.781	.359
N	0.87	.188	-.776

LOT = Life Orientation Test, SWLS = Satisfaction with Life Scale, PASTAS = Physical Appearance State and Trait Anxiety Scale, S/EST = Self-esteem, E = Extraversion, N = Neuroticism.

STUDY 2

The psychological effect of cognitive, behavioural and emotional weight and shape concern

Six dichotomous (yes/no) appearance-related questions were devised by the researcher based on findings from the empirical literature and from study 1, to tap into behavioural (both external and internal), emotional (both positive and negative), and cognitive domains, in relation to appearance self-appraisal. The 6 questions are independent variables and the validated measures are the dependent variables.

The *cognitive* questions ask about the extent to which the participants *think* their appearance will affect their future happiness and whether or not they would consider plastic surgery to change their appearance. The plastic surgery question was added in response to it being identified as important for an adolescent cohort in the preliminary study. The *behavioural* questions ask about being bullied because of appearance, which is an *external behaviour*, and whether they have been on a diet to change their appearance, which is an *internally regulated behaviour*. The *emotional* questions ask about feeling guilty about eating, which is a *negative emotion*, and about whether participants have happy with their appearance, which is a *positive emotion* associated with appearance.

The research aims of this study were (i) to establish the relative impact of physical appearance related emotions, behaviours and cognitions on correlates of SWB, and (ii) to examine this impact across early-adolescence, mid-adolescence and late-adolescence. The first hypothesis was that girls who endorse the positive responses to the appearance-related questions (happy with their appearance and don't think it will affect their future happiness, have never been bullied because of the way they look, would not consider plastic surgery, don't feel guilty about eating and have not been on a diet), would also endorse the positive correlates of SWB to a

greater extent and the negative correlates to a lesser extent, than girls who endorse negative responses to the appearance-related questions. The second hypothesis was that appearance-related concerns would exert a stronger influence on correlates of SWB in the mid-adolescent group because of hormonal changes that occur at this crucial time.

Results

Descriptive statistics

The frequency of responses to the six questions across the 3 groups making up the combined cohort is shown in table 3.2.

Table 3.2: Responses to the 6 dichotomous questions across the cohort

		Year 8 (*n = 127*)	Year 9 (*n=267*)	U/grad (*n=149*)	Combined (*n=546*)
Q1: My appearance will affect my future happiness	Yes	40 (32%)	121 (45%)	79 (53%)	241 (44%)
	No	87 (68%)	146 (65%)	70 (47%)	305 (56%)
Q2: I have been bullied because of my appearance	Yes	30 (24%)	88 (33%)	60 (40%)	180 (33%)
	No	97 (76%)	179 (67%)	89 (60%)	366 (67%)
Q3: I have been on a diet to change my appearance	Yes	45 (35%)	156 (58%)	94 (63%)	296 (54%)
	No	82 (65%)	111 (42%)	55 (37%)	250 (46%)
Q4: I feel guilty about eating	Yes	44 (34%)	108 (40%)	55 (37%)	207 (38%)
	No	83 (66%)	159 (60%)	94 (63%)	339 (62%)
Q5: I am happy with my appearance	Yes	74 (58%)	129 (48%)	92 (62%)	296 (54%)
	No	53 (42%)	138 (52%)	57 (38%)	250 (46%)
Q6: I would consider plastic surgery to change the way I look	Yes	9 (7%)	72 (27%)	49 (33%)	130 (24%)
	No	118 (93%)	195 (73%)	100 (67%)	416 (76%)

The proportion of girls with the belief that their appearance will affect their future happiness rises consistently with age from 32% at age 12, to 45% at age 14, and up again to 53% at age 18-19. This response pattern is repeated for the proportion of girls who have been bullied because of how they look (24%, 33% and 40% respectively), for those who have been on a diet to change how they look (35%, 58% and 63% respectively), and for those who would consider plastic surgery to change how they look (7%, 27% and 33% respectively). These consistent increases in the proportion of the girls affected could reflect an increase in awareness of the beauty ideals along with increased life experience.

However, the frequency of responses across the emotional domains shows a very different pattern and highlights the difficulties felt during the height of adolescence. The proportion of early-adolescent girls who are happy with their appearance is at 58% at age 12, during adolescence it is then reduced to 48% by age 14, and it recovers to 62% in late-adolescence at age 18-19. The opposite pattern is found in relation to feeling guilty about eating, with only 34% of 12 year olds feeling guilty, this rises to 40% at age 14, and then reduces to 37% at age 18-19. These patterns demonstrate the heightened emotions experienced with hormonal changes during adolescence.

Inferential statistics

The dichotomous questions were then used to examine their impact on correlates of SWB for each cohort individually and combined to establish the extent of the impact at each developmental stage.

12 year old cohort

The results for the early-adolescent 12 year olds are shown in Table 3.3, with means and standard deviations available in appendix 3C).

Table 3.3: Independent measures t-test results and MANOVA for correlates of SWB in relation to 6 dichotomous questions at age 12

Independent variables are shown in columns and dependent variables are shown in rows.

N = 130	Q1Future	Q2 Bullied	Q3 Diet	Q4 Guilty	Q5 Happy	Q6 Surgery
Df (3, 126)	Cog	Beh	Beh	Emo	Emo	Cog
Partial η^2	.11		.10	.12	.33	
Wilks' λ	.89		.90	.88	.82	
F	**3.84****		**3.36***	**4.26****	**15.26*****	
Box's M	.13		.93	.05	.28	
SWLS	-2.70**	-3.23***	-1.52	-1.82	3.93***	-.88
PASTAS	3.48***	1.39	2.83**	3.68***	-7.70***	2.78*
LOT	-2.96**	-.77	-3.38***	-2.12*	2.29**	-.11
S/EST	-3.16***	-1.90	-3.02**	-3.73***	5.32***	-2.12*
E	-1.20	.30	-1.40	-1.88	1.14	-.30
N	1.14	-.03	2.33*	2.65**	-.73	.11

**p<.05, **p<.01, ***p<.001, SWLS = Satisfaction with Life Scale, PASTAS = Physical Appearance State and Trait Anxiety Scale, LOT = Life Orientation Test, S/EST = Self-esteem, E = Extraversion, N = Neuroticism, Cog = Cognitive question, Beh = Behavioural question, Emo = Emotional question.*

Results should be interpreted with caution due to the differences in sample sizes between groups, particularly in respect of considering plastic surgery to change appearance (9-118) and being bullied because of appearance (30-97). However, it should be noted that Levene's test demonstrated no problems with equality of variances for most of the tests ($p>0.05$), with the exception of optimism in respect of future happiness ($p<0.05$) and feeling happy with appearance ($p<0.05$) where this is violated, and self-esteem in respect of feeling guilty ($p<0.05$), and life-satisfaction in respect of dieting ($p<0.05$), feeling guilty ($p<0.05$), future happiness ($p<0.05$) and feeling happy with appearance ($p<0.05$), but the correction was applied in all instances and the more moderate result reported. Moreover, Box's test of equality of covariance matrices was violated at $p<0.01>0.001$, so was not extreme. For this early-adolescent cohort, the impact is greatest on physical appearance anxiety, optimism and self-esteem, as all the questions apart from those being discounted because of uneven sample sizes yielded moderate statistically significant results.

Results were in the predicted direction with girls who have been bullied because of their appearance reporting significantly lower life-satisfaction ($p<0.001$) than those who have not been bullied, and girls who would consider plastic surgery reporting significantly greater physical appearance anxiety ($p<0.05$) and lower self-esteem ($p<0.05$) than those who would not consider plastic surgery. Multivariate analysis confirmed that girls who believe that their appearance will affect their future happiness have significantly greater physical appearance anxiety along with poorer optimism and self-esteem, and are less satisfied with life ($p<0.01$) than girls without this belief, with the opposite being true of girls who are happy with their appearance ($p<0.001$). Girls who have been on a diet to change their shape have significantly greater physical appearance anxiety and neuroticism, and significantly lower optimism and

self-esteem (p<0.05) than girls who have not dieted. This is also true for girls who feel guilty about eating (p<0.01).

14 year old cohort

Table 3.4: Independent measures t-test results and MANOVA for correlates of SWB in relation to 6 dichotomous questions at age 14

Independent variables are shown in columns and dependent variables are shown in rows.

N = 267	Q1Future	Q2 Bullied	Q3 Diet	Q4 Guilty	Q5 Happy	Q6 Surgery
Df (5, 261)	Cog	Beh	Beh	Emo	Emo	Cog
Partial η^2	.14	.18	.13	.15	.27	.03
Wilks' λ	.80	.82	.87	.85	.73	.97
F	**8.27*** **	**11.35*** **	**12.99*** **	**11.76*** **	**19.70*** **	**2.86***
Box's M	.09	.00	.07	.04	.31	.72
SWLS	-5.48***	-4.98***	-3.76**	-3.97***	6.90***	-2.65**
PASTAS	5.57***	4.31***	6.22***	6.94***	-8.95***	2.13**
LOT	-4.02***	-2.15*	-2.10*	-1.31	3.84***	1.34
S/EST	-4.33***	-4.92***	-4.32***	-5.56***	6.24***	-2.56**
E	-1.58	-2.32*	.43	-.76	1.10	1.47
N	2.44**	2.26*	2.19*	2.52**	-2.34**	.12

**p<.05, **p<.01. ***p<.001, SWLS = Satisfaction with Life Scale. PASTAS = Physical Appearance State and Trait Anxiety Scale. LOT = Life Orientation Test. S/EST = Self-esteem. E = Extraversion. N = Neuroticism. Cog = Cognitive question. Beh = Behavioural question. Emo = Emotional question.*

Results for the cohort of mid-adolescent 14 year old girls (shown in table 3.4, with means and standard deviations are available in appendix 3E), were in the direction

predicted with t-tests yielding statistically significant results across most correlates of subjective wellbeing, with the exception of extraversion which seems to not be affected by the cognitive, behavioural or emotional aspects of weight and shape concern. This suggests that during adolescence, concern about weight or shape and eating concerns leading to guilt or dieting behaviours, is positively associated with low life-satisfaction, high physical appearance anxiety, low optimism, low self-esteem and high neuroticism. There appears to be little to differentiate between cognitive, behavioural and emotional domains because they are all equally influential, but this could be because they impact on each other.

Multivariate analyses confirmed that girls who were happy with their appearance reported lower physical appearance anxiety and neuroticism, and greater optimism and self-esteem than girls who were not happy with their appearance ($p<0.001$). The reverse was found to be true for girls who had dieted ($p<0.001$), had been bullied ($p<0.001$) and who believed that their appearance would affect their future ($p<0.001$). Girls who would consider plastic surgery had greater physical appearance anxiety, along with lower self-esteem and life-satisfaction ($p<0.05$) and this was also true for girls who felt guilty about eating, with the addition of greater neuroticism ($p<0.001$).

It should be noted that Levene's test demonstrated some problems with equality of variances, particularly in respect of self-esteem where this is violated across all the questions ($p<0.05$), and for optimism and life-satisfaction, where this is violated for all items except feeling guilty and having surgery ($p>0.05$), but the correction was applied in all instances and the more moderate result reported. Moreover, there was one extreme violation of Box's test of equality of covariance matrices ($p<0.001$)

18-19 year old cohort

Table 3.5: Independent measures t-test results and MANOVA for correlates of SWB in relation to 6 dichotomous questions at age 18-19

Independent variables are shown in columns and dependent variables are shown in rows.

N= 149	Q1Future	Q2 Bullied	Q3 Diet	Q4 Guilty	Q5 Happy	Q6 Surgery
Df (4, 144)	Cog	Beh	Beh	Emo	Emo	Cog
Partial η^2				.06	.30	
Wilks' λ				.94	.70	
F				**2.44***	**15.70*****	
Box's M				.39	.79	
SWLS	-1.93	-.11	-1.38	-2.50**	5.06***	-.62
PASTAS	2.63**	.73	2.12*	4.25***	-5.81***	1.55
LOT	-.18	-.56	-.79	-2.02*	2.91**	-1.13
S/EST	-2.76**	-.75	-.90	-3.84***	6.64***	-2.14*
E	.05	2.10*	1.75	-.96	1.46	1.65
N	1.20	1.97	-.30	2.96**	-2.09*	2.29*

**p<.05, **p<.01, ***p<.001, SWLS = Satisfaction with Life Scale, PASTAS = Physical Appearance State and Trait Anxiety Scale, LOT = Life Orientation Test, S/EST = Self-esteem, E = Extraversion, N = Neuroticism, Cog = Cognitive question, Beh = Behavioural question, Emo = Emotional question.*

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The t-tests for the cohort of late-adolescent 18-19 year old girls (shown in table 3.5, with means and standard deviations available in appendix 3F), yielded statistically significant results across the two emotional domain questions, but much of the differences evident at age 14 appear to have dissipated. Multivariate analyses confirmed that girls who feel guilty about eating report greater physical appearance anxiety and neuroticism, along with lower optimism and self-esteem than girls who do

not feel guilty (p<0.05), with the reverse being true for girls who are happy with their appearance (p<0.001). The remaining factors yielded non-significant results which perhaps suggest that, although age 18-19 years is an age where weight and shape concern are important, the late-adolescent females have developed more appropriate coping strategies to deal with these concerns. Moreover, behavioural aspects such as dieting to change appearance have become more normalised within this age group, with those who have not dieted forming the minority. Being bullied because of appearance is most prevalent in this cohort, perhaps because there is a longer time elapsed for this to happen, but it does not seem to have impacted on correlates of SWB with the exception of extraversion, with those who have been bullied being less extraverted than those who have not.

It should be noted that Levene's test demonstrated no problems with equality of variances for most of the tests (p>0.05), with the exception of optimism in respect of dieting, feeling guilty and being bullied (p<0.05) where this is violated, and self-esteem in respect of feeling guilty, future happiness and surgery (p<0.05) but the correction was applied in all instances and the more moderate result reported. Moreover, there was no violation of Box's test of equality of covariance matrices (p>0.05).

Combined cohort

The t-tests for the combined cohort yielded moderate statistically significant results across all of the correlates of SWB with the exception of extraversion, which appears to not be implicated in weight and shape concern. It should be noted that Levene's test demonstrated no problems with equality of variances for physical appearance anxiety, extraversion or neuroticism (p>0.05), but this is violated across self-esteem, optimism and life-satisfaction (p<0.05), however the correction was

applied in all instances and the more moderate result reported. Results are shown in table 3.6, with means and standard deviations available in appendix 3G.

Table 3.6: Independent measures t-test results and MANOVA for correlates of SWB in relation to 6 dichotomous questions in combined cohorts.

Independent variables are shown in columns and dependent variables are shown in rows.

N = 546	Q1Future	Q2 Bullied	Q3 Diet	Q4 Guilty	Q5 Happy	Q6 Surgery
Df (5, 540)	Cog	Beh	Beh	Emo	Emo	Cog
Partial η^2	.11	.16	.07	.12	.28	.04
Wilks' λ	.09	.84	.93	.88	.72	.97
F	**10.51*** **	**25.31*** **	**8.04*** **	**14.30*** **	**42.42*** **	**6.80*** **
Box's M	.06	.003	.002	.01	.01	.01
SWLS	-6.45***	-5.48***	-4.43***	-4.99***	9.35***	-2.95**
PASTAS	-7.21***	-4.40***	-7.45***	-8.89***	13.25***	-3.97***
LOT	-4.42***	-2.12*	-3.48***	-2.94***	5.22***	.11
S/EST	-5.81***	-4.67***	-4.98***	-8.17***	10.30***	-3.88***
E	-2.35**	-1.28	-.41	-1.74	1.76	.68
N	3.06**	2.83**	2.88**	4.47***	-3.13**	1.38

**p<.05. **p<.01. ***p<.001, SWLS = Satisfaction with Life Scale. PASTAS = Physical Appearance State and Trait Anxiety Scale. LOT = Life Orientation Test. S/EST = Self-esteem. E = Extraversion. N = Neuroticism. Cog = Cognitive question. Beh = Behavioural question. Emo = Emotional question.*

Multivariate tests confirmed that in the combined cohort, the belief that appearance would affect future happiness elicited significant differences across all the correlates of SWB in the direction predicted (p<0.001). Poorer life-satisfaction, self-esteem and optimism, along with greater physical appearance anxiety and neuroticism was reported in girls who had

been bullied ($p<0.001$), had dieted ($p<0.001$), felt guilty about eating ($p<0.001$) and were unhappy with their appearance ($p<0.001$). Girls who would consider plastic surgery also had lower self-esteem and life-satisfaction along with greater physical appearance anxiety ($p<0.001$). However, it should be noted that Box's test of equality of covariance matrices was violated, but this was not extreme ($p<0.01>0.001$).

Discussion

The primary research aim of this study to establish the relative impact of physical appearance-related emotions, behaviours and cognitions on correlates of SWB was met at each stage of adolescence, and the research hypothesis that girls who endorse the positive responses to the dichotomous questions (happy with their appearance and don't think it will affect their future happiness, have never been bullied because of the way they look, would not consider plastic surgery, don't feel guilty about eating and have not been on a diet), would also endorse the positive correlates of SWB to a greater extent and the negative correlates to a lesser extent, than girls who endorse negative responses to the questions was supported, with all statistically significant differences being in the expected direction. Although the impact of adolescent body dissatisfaction on self-esteem (Johnson, & Wardle, 2005) and depressive symptoms (Sjoberg et al., 2005; de Wit et al., 2010) is well documented, this study is novel in building on existing knowledge to also include the wider impact of body dissatisfaction on both positive and negative aspects of SWB.

By dissecting the experience of body dissatisfaction into emotional, behavioural and cognitive responses, well-being was evaluated from both a hedonic perspective (associated with affective factors) and a eudaimonic perspective (associated with cognitive factors) to take account of psychological health beyond simple happiness (Deci, & Ryan, 2008). This has important outcomes because it supports the application of appropriate brief interventions such as cognitive behavioural therapy, because the therapist can quickly target the factor to be manipulated for maximal change (Stasiak, Hatcher, Frampton, & Merry, 2014).

When examining changes over time, the prevalence of the negative cognitive and behavioural responses increased in a linear pattern from early adolescence to late adolescence, perhaps reflecting an increased awareness of societal beauty norms and the pressure to conform (Vogt Yuan, 2010). Therefore, this could represent a normative response in western society rather than a maladaptive response. However, the prevalence of emotional responses followed a different pattern, with negative responses peaking at mid-adolescence. Although this study is cross-sectional rather than longitudinal, these results strongly suggest that young girls may be more emotionally susceptible to physical appearance concerns at mid-adolescence, a notion that is supported by previous literature (Asci et al., 2006).

Moving away from prevalence data, appearance-related emotions, behaviours and cognitions exert a statistically significant impact across all domains of SWB at mid-adolescence, but only appearance-related emotions exert an impact across all three phases of adolescence. This adds further support for mid-adolescence being a crucial age where appearance-related concerns influence all aspects of psychological health, and adds to the existing knowledge by suggesting that the emotional aspects remain present in the psyche at late adolescence. Therefore, any interventions to alleviate appearance-related anxiety should target emotional aspects at mid-adolescence to prevent the negative emotions becoming embedded in the psychological schema.

.STUDY 3

The means, variances and stability of the constructs at the different stages of development

The correlates of subjective wellbeing selected were assessed for stability across the cohorts to examine the impact of developmental maturity at each age. Therefore the cohort groups are independent variables and the validated measures are of wellbeing correlates are the dependent variables.

Correlates of subjective well-being that may be considered internal factors, such as dispositional optimism (LOT), extraversion and neuroticism, tend to be stable over time, so are predicted to be less affected by the pressures of the stigma of obesity than other correlates of subjective well-being which could be considered outcome variables, such as self-esteem, life satisfaction and physical appearance anxiety. Higher consistency across the cohorts is therefore expected for the internal factors.

The research aims of this study were to (i) test the stability of the measures across early, mid and late adolescence and (i) to identify critical markers of vulnerability for an adolescent cohort. In respect of the first aim, it is hypothesised that internal variables will be more stable than outcome variables, and in respect of the second aim it is expected that mid adolescence will be a critical point of vulnerability and physical appearance anxiety will play a critical role.

Results

Table 3.7 presents the mean scores for the three groups combined and separately.

Table 3.7: Descriptive statistics and ANOVAs (one-way) for three student cohorts on six self-report measures

	Year 8 Mean (sd)	Year 9 Mean (sd)	Undergrad Mean (sd)	Combined Mean (sd)	F-test
LOT	20.55	20.31	20.05	20.30	0.46
	(4.21)	(4.52)	(4.38)	(4.41)	
PASTAS	22.28	27.31	25.51	26.64	8.80***
	(12.24)	(11.66)	(9.22)	(11.36)	
S/E	35.84	34.07	35.90	34.99	3.74*
	(7.17)	(8.19)	(7.11)	(7.71)	
SWLS	25.15	24.06	24.05	24.31	1.51
	(6.31)	(6.53)	(5.71)	(6.27)	
E	25.61	27.35	29.44	27.36	19.31***
	(4.18)	(5.29)	(5.43)	(5.31)	
N	17.68	18.07	18.52	18.19	0.80
	(6.81)	(6.7)	(5.31)	(6.39)	

** p< .05. *** p< .001. LOT = Life Orientation Test. PASTAS = Physical Appearance State and Trait Anxiety Scale. S/E = Self-esteem. SWLS = Satisfaction with Life Scale. E = Extraversion. N = Neuroticism.*

The mean score on LOT in the combined cohort (20.30) is a reflection of the scores for each group at years 8 (12 year olds), 9 (14 year olds) and undergraduate level (18/19 year olds) with only half a mean point difference between the three groups. On the SWLS the mean score

for the combined cohort (24.31) also reflects minimal differences between the three groups (25.15, 24.06 & 24.05 for years 8, 9 and undergraduate respectively), as does the mean score for combined cohorts on Neuroticism (18.19) with groups means being 17.68, 18.07 and 18.52. None of the between group differences is statistically significant as shown by overall F-test and post hoc tests ($p > .05$).

In relation to Self-esteem, the combined mean scores (34.99) embodies differences between the year 9 group (34.07), and both the year 8 group (35.84) and the undergraduates (35.90). The year 9 group reported lower self-esteem than the year 8 group, reflected in a significant F-test ($F = 3.74$, $p < .05$) and post hoc test, and there is a significant difference between the year 9 group and the undergraduates, and the year 9 and year 8 groups ($p < .05$), but only with a one-tailed test, and therefore not a robust finding. With all three groups there is substantial variance from the mean with standard deviations around 7 to 8. It can be concluded that in general the three groups are fairly comparable across the three constructs and measures highlighted above both in terms of where mean scores are nested and with reference to dispersion of scores or individual differences evident in the standard deviations.

However, when the scores for PASTAS are examined, a different pattern emerges. Although the overall mean is 25.62, the lowest anxiety is reported from the year 8 students (22.28), the highest scores with the year 9 group (27.31) and the next highest with the undergraduate group (25.51). The F-test shows that the model is significant ($F = 8.80$, $p < .001$), and the post hoc tests reveal a significant difference between year 8 and 9 ($p < .001$), and year 9 and the undergraduates ($p < .05$). Variances between years 8 and 9 are similar, but there are differences in variances between both these groups and the undergraduates, although dispersion is substantial in all groups.

The scores for Extraversion generated a completely different pattern of scores. The overall mean score is 27.36, the lowest extraversion scores reported being from the year 8 students (25.61), followed by the year 9 group (27.35) and the highest scores with the undergraduate group (29.44). The F-test shows that the model is significant ($F = 19.31$, $p < .001$), and the post hoc tests reveal a significant difference between all groups ($p < .001$). Variances across all groups are similar, with a small increase from year 8 to 9 and year 9 to undergraduate. The data demonstrates that higher extraversion is associated with older participants and this is spread across all groups, suggesting an increase with age due to natural maturity rather than an association with either obesity or body image anxiety.

Overall, it is remarkable that from the constructs assessed, the one that identifies between group differences most strongly is the PASTAS. Although this study was not longitudinal and mean shift cannot be inferred within groups, the strong difference between years 8 and 9 might imply that this is so, given the stable consistencies across the other measures.

Given that both extraversion and neuroticism appear to be unconnected with the impact of being overweight or obese in this adolescent cohort, as seen in Tables 3.3 to 3.6, these variables were not included in further analysis.

The data from the remaining variables was correlated and all correlation coefficients were significant in the expected directions at $p < .001$ level and all were moderately strong, with r's ranging from: -.31 to -.59, as shown in Table 3.8. Participants who were higher in dispositional optimism (LOT) were also likely to be higher in self-esteem ($r = .42$) and satisfaction with life ($r = .57$), and lower in physical appearance anxiety: PASTAS ($r = -.31$). Moreover, respondents who were higher in self-esteem were also likely to report higher levels of satisfaction with life (r

= .55). PASTAS is negatively associated with the other three measures as expected (*r*'s = -.31, -.45 & -.59). These findings support the notion of combining discrete measures of positive affect, negative affect and life-satisfaction to establish overall SWB.

Table 3.8: Correlation coefficients for key self-report measures in combined cohorts

	LOT	PASTAS	Self-esteem	SWLS
LOT	.86	-.31***	.42***	.57***
PASTAS		.89	-.59***	-.45***
Self-esteem			.91	.55***
SWLS				.86

**** p< .001. SWLS = Satisfaction with Life Scale, LOT = Life Orientation Test, PASTAS = Physical Appearance State and Trait Anxiety Scale. Reliabilities are in the diagonals.*

The two multiple regression models presented in Table 3.9 were set to test the association of constructs that may impact on perceptions of well-being and self-esteem. These models allowed further refinement of the study's hypotheses supported through the correlation matrix presented in Table 3.8.

Both models presented in Table 3.9 are statistically significant as shown by the high F-values ($p < .001$). PASTAS and LOT combine to explain 31% of the variance on SWLS and both are unique significant predictors within the model. The beta weights presented are almost identical although the direction is negative for PASTAS and positive for LOT. In the model with self-esteem postulated as the outcome measure, the two IVs again combine to explain both combined and unique variance (41%). Moreover, the position and negative direction of effect are the same as the SWLS model, although the beta values show that PASTAS has more weight than

LOT. In summary, the two IVs explain substantial variance (31% & 41%) on young people's perception of well-being and self-esteem within this sample and although the two DVs overlap (*r* = .55) they are sufficiently independent to warrant separate examination.

Table 3.9: Multiple regression analyses for PASTAS and LOT as predictors of self-reported well-being (satisfaction with life scale & self-esteem)

	SWLS			Self-esteem		
	B	SE B	β	B	SE B	β
PASTAS	-.19	.02	-.34***	-.34	.02	-.51***
LOT	.50	.05	.35***	.46	.06	.26***
F (df)	121.98 (2, 543)***			189.43 (2, 543)***		
Adj. R^2	.31			.41		

**** p< .001. SWLS = Satisfaction with Life Scale, LOT = Life Orientation Test, PASTAS = Physical Appearance State and Trait Anxiety Scale.*

Discussion

The primary research aim of this study was to test the stability of the measures across early, mid and late adolescence and it was predicted that dispositional optimism, extraversion and neuroticism would be stable across the age groups because they are based on internal predispositions, whereas physical appearance anxiety, self-esteem and life-satisfaction are more susceptible to external forces, so would be less stable across the age groups. This hypothesis was partially supported in respect of internal variables, as dispositional optimism and neuroticism were stable across the three groups, but extraversion increased in a linear fashion from early adolescence, through mid-adolescence and peaked at late adolescence, which perhaps represents an aspect of the process of growing up, with higher levels of extraversion reflecting a new-found confidence in themselves as young women, independent of other correlates of SWB. Roberts, Walton and Viechtbauer (2006) found that extraversion increases in early adulthood, but the current study suggests that this process begins much earlier, further contributing to the literature. In terms of external variables, the hypothesis was again partially supported with mid-adolescence being associated with a peak in physical appearance anxiety and a dip in self-esteem. However, life-satisfaction was consistent across the age groups and the expected dip in life-satisfaction at mid-adolescence was not found. This could perhaps be explained by life-satisfaction being a cognitive correlate of SWB, and therefore less vulnerable to emotional variances associated with hedonic aspects of SWB in adolescence (Butkovic et al., 2012).

The secondary aim of this study was met and the hypothesis was supported, with mid-adolescence being identified as a critical point of vulnerability and physical appearance anxiety being confirmed as having a pivotal role. Zero order correlations demonstrated significant moderate to strong relationships between dispositional optimism, physical appearance anxiety, self-esteem and life-satisfaction, supporting previous findings that hedonic and eudaimonic

aspects of well-being correlate significantly (Waterman et al., 2008). Moreover, multiple regression analysis confirmed that the hedonically orientated physical appearance anxiety combined with the eudaimonically orientated dispositional optimism to explain 31% of the variance in life-satisfaction and 41% of the variance in self-esteem, thus expanding the literature further.

STUDY 4

Data modelling across the correlates of subjective well-being

Given the findings of the regression models in Study 3, where physical appearance anxiety (PASTAS) and dispositional optimism (LOT) combine to explain 31% of the variance on life satisfaction (SWLS), and 41% of the variance on self-esteem, the next appropriate step is to model the data using structural equation modelling.

The data for the combined cohorts was used to create an overall model of correlates of subjective-wellbeing for an adolescent population. Because of the importance of body weight in the adolescent sample, a hierarchical model of PASTAS (coded PastasHRa) was created with 2 factors to examine weight-related items such as 'the extent to which I am overweight' (coded PastasHRb), separate from non weight-related items such as 'my feet' (coded PastasHRc).

The research aim of the study is to accurately predict the impact of dispositional optimism and physical appearance anxiety on in life-satisfaction and self-esteem in an adolescent cohort. Dispositional optimism (coded LOTlatent) is considered to be an internal trait, so although it is understood from the previous regression analysis that it combines with physical appearance anxiety to explain much of the variance on self-esteem and life satisfaction, it is hypothesised that it will also explain some of the variance on physical appearance anxiety. As such, it is predicted that it will have an indirect effect on the outcome variables of self-esteem and life satisfaction via PASTAS, in addition to the expected direct effect.

Methodological rationale for SEM model

The model presented in figure 3.1 was constructed after a few iterations that considered alternative approaches. This final model was selected for three compelling reasons: (1) It yielded the best model fit as shown by the fit indices presented in the results; (2) It explains substantial variance on satisfaction with life (51%) and self-esteem (73%). (3) It offered a more parsimonious approach than the alternatives and thus avoided the penalty exacted for over complex fit that is assessed by the family of fit indices that address parsimony (Byrne, 2010). It was thus concluded that this was the most adequate and satisfactory approach to explain the relationship between these constructs *within this sample*.

An alternative approach addressed in the iterative process of building up the model was the non-inclusion of the hierarchical approach currently presented, that is, using the PASTAS as the higher order factor with its two subscales as the second order factors. It should be noted that the three components could not be used simultaneously in relation to the two outcome variables, self-esteem and satisfaction with life, as that would violate the basic regression assumption of independence (as well as the fact that AMOS does not allow such a model). However, the two subscales were configured with a covariance between them (and without a covariance between them), with direct arrows to the two outcome variables. However, the model fit and variance explained were inferior to the hierarchical approach finally adopted and any further attempt to add LOT as an indirect predictor would have weakened the model further by the penalties outlined above. It is recognised that hierarchical factor models sometimes offer the best solution (Bossher & Smit, 1998) and it appears that within this sample the PASTAS as a composite construct has more value in explaining variance on satisfaction with life and self-esteem than alternative approaches.

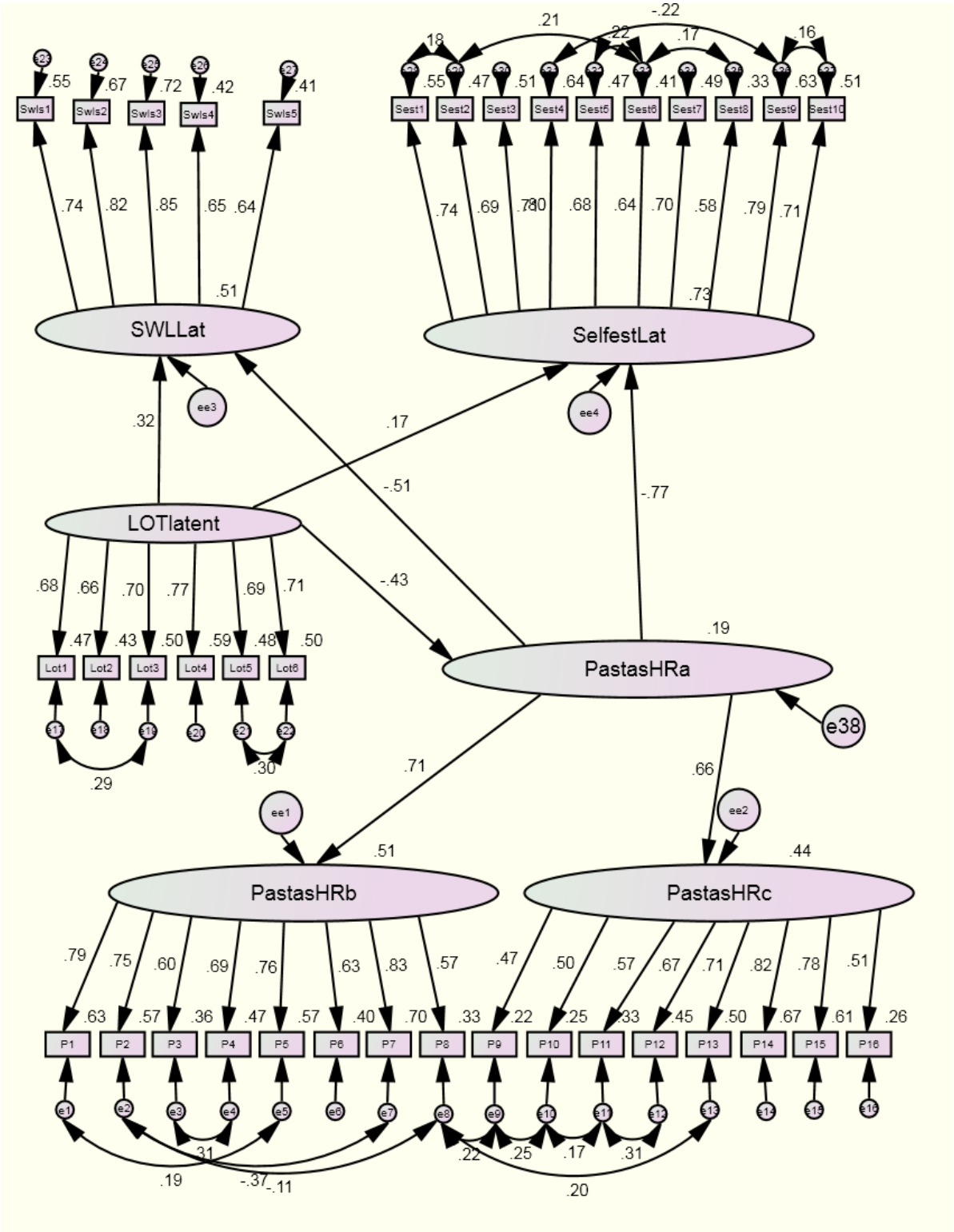
Results

The results demonstrate a structural equation model with very strong model fit indicators, as shown in table 3.10. Hu and Bentler, (1999) suggest that in order to minimise the chances of Type I or Type II errors within the model fit due to sample size, indicator combinations containing relative fit indices, such as the Tucker-Lewis Index (TLI >.95), non-centrality based indices, such as Root Mean Square Error of Approximation (RMSEA <.08) and Comparative Fit Index (CFI >.95) along with absolute fit indices, such as Standardised Root Mean Residual (SRMR <.06) should be considered. The indicators in the current model comprise a strong combination of high comparative fit index (CFI = .956) and Tucker-Lewis Index (TLI = .952), along with low root mean square error of approximation (RMSEA = .036), standardised root mean residual (SRMR = .0423) and Chi² degrees of freedom ratio (χ^2/df ratio = 1.713). In addition, the factor loadings for each latent model are high (above.50), with the exception of factor 9 on the PASTAS (.47). This factor relates to anxiety about ones ears, which is more of an issue for male adolescents than female adolescent (American Institute of Plastic Surgeons, 2013)), perhaps because in girls ears can be more easily covered by long hair.

Table 3.10: Model fit indices for structural equation model of PASTAS and LOT as predictors of self-reported well-being (life-satisfaction & self-esteem)

Comparative Fit Index	Score
χ^2 (df = 605)	1036.27
RMSEA	0.036
SDMR	0.042
CFI	0.956
TLI	0.952
χ^2/df ratio	1.171

RMSEA = Root Mean Square Error of Approximation. SDMR = Standardised Root Mean Residual. CFI = Comparative Fit Index. TLI = Tucker-Lewis Index. χ^2/df ratio = Chi² degrees of freedom ratio.



Pastas HRa = PASTAS total. Pastas HRb = PASTAS weight related. Pastas HRc = PASTAS non-weight related. LOTlatent = Dispositional Optimism. SWLLat = Satisfaction with Life. Selfestlat = Self-esteem.

Figure 3.1: Structural Equation Model of impact of PASTAS and LOT on Self-esteem and Life satisfaction

The structural equation model (figure 3.1) shows high factor loadings for each regression model, demonstrating that each regression model is working well. Generally effect sizes are large and the directions are as predicted with dispositional optimism exerting a positive effect and physical appearance anxiety exerting a negative effect. The pathways between the models are significant.

As predicted, dispositional optimism explains 19% of the variance of physical appearance anxiety (PastasHRa), so may ameliorate some of the negative consequences of physical appearance anxiety. Dispositional optimism negatively impacts on physical appearance anxiety (-.43), and positively impacts on both life satisfaction (.32) and self-esteem (.17). However, as dispositional optimism negatively impacts on physical appearance anxiety (-.43), it exerts an additional indirect effect on both life satisfaction and self-esteem. Moreover, the indirect effects from optimism through physical appearance anxiety (PastasHRa) to both life satisfaction: .22 (95% Confidence Intervals: .14 to .32, $p<0.01$) and self-esteem: .33 (95% Confidence Intervals; .22 to .48, $p<0.01$) were statistically significant as observed from Bootstrapping. Total physical appearance anxiety (PastasHRa) negatively impacts on both life satisfaction (-.51), and self-esteem (-.77), and is a stronger direct predictor than dispositional optimism in this model. Dispositional optimism and physical appearance anxiety combine to explain 51% of the variance in life-satisfaction (SWLLat) and 73% of the variance in self-esteem (SelfestLat).

The correlated residual errors in the model may be as a result of the specific peculiarity of the sample and are a limitation of the model in that, although the model is robust and replicable, the correlated residual errors would not be replicated (Byrne, 2010). There were no cross-factor loadings included in the model so overall, the model is robust and works well to explain much of the variance of the outcome variables of life satisfaction and self-esteem.

Discussion

The research aim of the study was met as the variance on life-satisfaction and self-esteem predicted by dispositional optimism and physical appearance anxiety in an adolescent cohort was established. Moreover, physical appearance anxiety was found to be the strongest predictor on life-satisfaction and self-esteem, however no differences found between weight-related items and non-weight-related items. This suggests that appearance-related concern in adolescents is pervasive for both obese and healthy-weight adolescents, and goes beyond the stigma associated with obesity.

The experimental hypothesis was supported in relation to dispositional optimism which exerted both a direct and an indirect effect on the outcome variables of self-esteem and life satisfaction via physical appearance anxiety. This suggests that optimism offers some protection against the negative impact of physical appearance anxiety in on self-esteem and life-satisfaction in adolescents, and provides an original contribution to knowledge. As optimism can be successfully taught by learning to dispute the stable nature of internal attributions (Sujan, 1999), this finding would suggest interventions based on learned optimism to improve life-satisfaction and self-esteem during adolescence would be beneficial to improve SWB. However, this should also be tempered with reality to caution against blind optimism, where positive beliefs are held despite evidence to the contrary, which could lead the individual to remain in a bad situation in the hope that things will improve (Warner, 2001).

Chapter summary

All three studies consistently demonstrate the impact of emotional responses to physical appearance anxiety being most profound in adolescence, a period when emotionally adolescents may be very self-involved, alternating between high expectations and poor self-concept (American Academy of Child and Adolescent's Facts for Families, 2008).

In study 2, the frequency of responses across the emotional domains highlights the difficulties felt during the height of adolescence (14 years old). This is shown in the proportion of early-adolescent girls who are happy with their appearance being at 58% at age 12, during mid-adolescence it is then reduced to 48% by age 14, and it recovers to 62% in late-adolescence at age 18-19. The opposite pattern is found in relation to feeling guilty about eating, with only 34% of 12 year olds feeling guilty, this rises to 40% at age 14, and then reduces to 37% at age 18-19. These patterns demonstrate the heightened emotions experienced with hormonal changes during adolescence.

In study 3 participants' scores on dispositional optimism (LOT), self-esteem, life satisfaction (SWLS) and physical appearance anxiety (PASTAS) were compared across the three groups of students at 12, 14 and 19 years old. A remarkable level of stability in response across the three groups was evident as shown in Table 3.7. No significant differences across the groups emerged in relation to SWLS and LOT, but small differences emerged on Self-esteem when years 8 and 9 were compared, with year 9 reporting lower Self-esteem than both year 8 and the undergraduates ($p < .05$, one-tailed). However, there is a clearly accentuated difference in PASTAS responses especially when year 8 was compared with year 9, with the latter reporting much higher anxiety ($p < .001$). The undergraduate students reported higher anxiety (mean = 25.51) than year 8 students (mean = 22.28), although a little lower than year 9 (27.31). Although

the study is not longitudinal, results strongly suggest that young girls may be more susceptible to physical appearance anxiety at around 14 as already suggested by the literature (Asci et al., 2006). College age students are also vulnerable to such beliefs (Anton et al., 2000), but this study suggests that their impression formation may have occurred at a much earlier age. These preliminary findings indicate that if an intervention study were introduced to improve psychological functioning (Loth, Mond, Wall, & Neumark-Sztainer, 2010), somewhere between 12 and 14 might be optimal as a sensitive or critical period. A longitudinal study would be required to trace more precisely the change in perceptions that occur in early adolescence.

In all responses to the measures there is considerable dispersion from the mean and this demonstrates that in the three cohorts involved in the study, strong individual differences are evident on each construct. However, the correlations presented in Table 3.8 show that there is a systematic relationship between the constructs, all in the expected directions. The LOT is of particular interest because of the growing role of optimism in the health literature (Seligman, 2008) with the general conclusion that it is adaptive to health-related conditions. Table 3.8 shows that it is positively and moderately related to self-esteem (r = .42) and SWLS (r = .57), and negatively related to PASTAS (r = -.31). Furthermore, the Multiple Regression Analyses reported in Table 3.9 demonstrates that it is uniquely associated with SWLS and self-esteem when controlling for PASTAS.

In study 4 the structural model demonstrated the powerful impact of both dispositional optimism and physical appearance anxiety on life-satisfaction and self-esteem, explaining 51% and 73% of the variance respectively. In addition, dispositional optimism accounted for 19% of the variance in physical appearance anxiety, so had both a direct and an indirect effect on the

outcome variables. The model was robust and suggests that interventions to improve self-esteem in adolescent girls should target both optimism and physical appearance anxiety.

Many of the adolescents in these studies are oriented toward optimism given that the combined mean score (20.55), along with a standard deviation of 4.21, is above the scale midpoint of 18 and therefore nested in the positive parameters of the scale. Optimism embodies control beliefs, coping and motivation, and is associated with problem-based rather than emotion-based coping (Maltby, Day & Macaskill, 2007). It may be that young people will be receptive and responsive to an optimism based message and intervention using the PSI model (Sharman, 2012). Closely allied to optimism is hope, which Snyder (2000) has operationalised as setting goals and pathways to them whilst keeping flexibility about changing pathways, with the individual as the active agent in bringing about the achievement of goals. Moreover, it has been asserted that optimism can be learned (learned optimism or explanatory style) even when dispositional optimism is not a given trait (Issacowitz, 2005). A contribution to knowledge from this study is to highlight the potential role of optimism in relation to weight-related physical appearance anxiety research and results suggest it could have a useful future role.

Various psychological theories or concepts have suggested mechanisms through which maladaptive approaches to dieting and exercise may develop. First, there is the idea of thin models promoted by the media creating the socio-cultural zeitgeist and leading to the internalisation of unrealistic thinness norms (Jackson, 2002; Warren et al., 2005). Second, there is Social Comparison Theory (Festinger, 1957), which suggests that young people compare themselves unfavourably with thinner models. Third, there is the concept of distorted perception through which young people may misclassify their weight with females prone to overestimation (Chang & Christakis, 2003). Finally, there is Self-discrepancy theory (Higgins, 1987) which

leads to the suggestion that the greater the discrepancy between idealised and actual weight the greater the likelihood that young people will experience Body Image Disturbance and Dissatisfaction which in turn will generate maladaptive behaviours related to eating and/or exercise (Thompson & van Den Berg, 2002).

The one aspect that all these maladaptive approaches to diet and exercise have in common is a learning or conditioning component implicated in the dynamics of behavioural and perceptual acquisition. It is evident from the literature that many adolescents are susceptible and vulnerable to the message that can impact negatively on their self-esteem (Johnson & Wardle, 2005). Given that many female adolescents' self-image is substantially comprised of body image, if perception of this is largely distorted and disproportionate (Neighbors, & Sobal, 2007), this is likely to have knock-on effects for overall self-esteem and well-being. So the findings from this study suggest that optimism may be a useful starting point to reverse the negative physical appearance disturbance which appears to begin, or accelerate, between the 12-14 year old transition and may be entrenched by college age.

In relation to both self-esteem and SWLS scores, it can be observed from Table 3.7 that the mean scores on these are in the positive parameters of each scale and are not especially low, although the variances show a considerable dispersion of scores. The negative correlation between the two measures and the PASTAS, observed in Table 3.8, suggests that physical appearance anxiety may have a negative impact on each. As noted, young females are fixated on body image (Asci et al., 2006), and being in the public eye (e.g. through exercise) is likely to diminish their happiness and Self-esteem (Diehl et al., 1998). A clear goal for future research is to factor body image anxiety into the spectrum of constructs that contribute to perceptions of well-being in young adolescents, especially for girls.

One possibility is for young people to choose to adhere to "learned helplessness" whilst accepting physical appearance dissatisfaction and disturbance. Another possibility is to change perception and acquire a new perspective, and this could be facilitated by a counter-culture designed to shift the zeitgeist toward self-acceptance. Alongside this is the possibility to engage in exercise programmes that can help reduce weight and give young people a sense of control over their own destiny (Dishman, Motl, Sanders, Felton, Ward, Dowda & Pate, 2004). Exercise avoidance is a reality for many young people (Anton et al., 2000), and according to Smith (2004), this is the result of the anxiety engendered by being in the public gaze. In this study some young people observed that the gym suits they were expected to wear during exercise were unflattering and only exacerbated the negative perception of themselves already present.

The physical and psychological benefits of exercise are widely reported (Hausenblaus et al., 2004), and exercise has been commended as a means of regulating weight, reducing anxiety and enhancing body image (summarised by Atalay & Gencoz, 2008). However, it is argued that exercise should not be pursued as a "compensatory behaviour" (LePage et al., 2008), and that the motive for exercise is crucial to the achievement of balanced living. It may be that in the quest to bring the message to young people, the potential for "pathological exercise" has often been overlooked. For example, the schools in the reported project requested help for those who opted out of exercise but not for those who may be exercise obsessed. Excessive exercise can be a problem with Anorexia Nervosa and so it is important that such individuals should be included in future school-related research and that a balanced approach to exercise is commended.

A key issue in this report is physical appearance anxiety and this is reflected in the PASTAS scores, especially for 14-year olds who registered the highest score of the three groups on this measure. This age period is an impressionable and vulnerable time for adolescent girls in

relation to body image (Atalay & Gencoz, 2008). General anxiety is associated with avoidance behaviours (Bandura, 1988) and the same has been found for specific anxiety related to bodily appearance (Anton et al., 2000). If this perception becomes entrenched and inveterate, avoidance of exercise could become a maladaptive and chronic response. Over the long term, physical appearance anxiety may impact on overall self-esteem and life satisfaction, as suggested by the direction of the correlations reported in this study.

Given that optimism is positively associated with self-esteem and SWLS, and negatively associated with PASTAS, it may be that it will emerge as a pivotal variable around which to base educational and intervention programmes to remediate the downward spiral dynamic suggested by Self-Discrepancy Theory (Higgins, 1987). Moreover, the levels of optimism in this group are fairly high and optimism can be learned (Issacowitz, 2005). However, a major challenge for schools and researchers is to design forms of exercise, and provide a wide enough variety of forms of exercise activities, to make it appealing and engaging to young adolescent females, especially those who are overweight, self-conscious and anxious about being in the public gaze (Smith, 2004; Koca & Asci, 2006). An additional rider is for schools to provide gym outfits that are not deemed to be unflattering to the young exercise participants.

These studies had limitations, including the use of the self-report method linked to a cross-sectional design. However, three separate samples of three different groups of adolescents were used in the study and were assessed by psychological constructs and measures that have sound psychometric properties. Data analysis demonstrated high reliability, strong individual differences and systematically consistent response patterns across the three samples. Therefore the differences between the samples related to PASTAS stand out as potentially crucial to identifying a transitional pattern of change through adolescence and suggest an optimal time

frame in terms of a sensitive or critical period when a strategic intervention could be efficacious. Finally, the high scores on optimism and its positive association with satisfaction with life and self-esteem, and its negative association with PASTAS, strongly suggest that this construct could be a key variable around which to measure and structure an intervention that tests change over time. Furthermore, although dispositional optimism is deemed to be trait-like, learned optimism can be adapted by the cognitive restructuring of beliefs.

Dissemination

The findings from these studies were presented at the Annual Conference of the Psychological Society of Ireland Division of Health Psychology, in Dublin in 2009.

Chapter 4

Obesity Surgery and Subjective Well-being

Prevalence of obesity surgery

Surgical treatments to reduce obesity are a well-established approach to the management of severe obesity, having been first introduced in America in the 1960's (Mason & Ito, 1967). Surgical procedures are sometimes referred to as 'bariatric surgery' or 'metabolic surgery' and can be designed to be restrictive, mal-absorptive, neuro-hormonal, or a combination of these factors. Irrespective of the mechanisms for weight-loss, obesity surgery has been defined as 'the operative manipulation of a normal organ or organ system to achieve a biological result for a potential health gain' (Buchwald & Varco, 1978).

Surgical treatments for obesity have been the subject of ongoing development since they were first introduced and are now considered a safe and effective form of treatment for the severely obese (American Society for Metabolic and Bariatric Surgery, 2013; Lodhia, & Morton, 2012), and the recovery time is minimalized with over 90% of procedures now being performed laparoscopically (Buchwald & Oien, 2009). Evidence suggests that weight-loss surgery has a high degree of clinical efficacy (Wilding, 2007; Mamplekou, Komesidou, Bissias, Papakonstantinou, & Melissas, 2005; Sjöström et al., 2004; Matthews, 2003), leading to the practice becoming more widespread.

The prevalence of obesity surgery has increased worldwide year on year since it was first introduced, and on examining trends in the most recent data for the period 2003 to 2008, all categories of common procedures have increased in number, but the absolute

growth rate of bariatric surgery (135% increase) has decreased when compared to the previous 5 year trend (266% increase), suggesting a slow-down in the increase in prevalence (Buchwald & Oien, 2009). The slow-sown in the increase of the prevalence of surgical procedures could result from budget restrictions, particularly in the UK where much of the financial burden rests with the NHS (Triggle, 2014).

Although the overall numbers of procedures performed have continued to increase, the proportion of differing procedures within the overall numbers is changing. The trend within Europe has demonstrated a decrease in the proportion of laparoscopic adjustable banding from 63.7% to 43.2%, along with an increase in laparoscopic standard Roux–Y gastric bypass from 11.1% to 39% (Buchwald & Oien, 2009). Although the laparoscopic adjustable banding procedure is cheaper than the laparoscopic standard Roux–Y gastric bypass (approximately £5,450 compared to approximately £12,000, Clinic Compare, 2014), it is a procedure that works solely by restriction of food intake so the weight loss is slower and it is less effective in the longer-term than the laparoscopic standard Roux–Y gastric bypass that works on both food restriction and mal-absorption (American Society for Metabolic and Bariatric Surgery, 2013), which could account for the change in prevalence of these procedures because it conforms more closely to NICE Guidelines (NICE, 2012), which are followed within the NHS.

The change in the proportion of surgical procedures undertaken in North America is reversed, with an increase in the proportion of the cheaper laparoscopic adjustable banding from 9% to 44%, along with a decrease in laparoscopic standard Roux–Y gastric bypass from 85% to 51% (Buchwald & Oien, 2009). This discrepancy between Europe and North America could relate to sources of funding, with the number of American patients medically

eligible for treatment being disproportionate to the amount of patients that receive treatment, due to discrepancies in medical insurance coverage (Mainous, Johnson, Saxena & Wright, 2013).

In the UK approximately 8,000 patients currently undergo NHS funded obesity surgery each year, but this could raise as it is estimated that up to 5% of the adult UK population could be eligible for obesity surgery, and the financial implication for the NHS could be significant (Triggle, 2014).

Characteristics of Obesity Surgery Candidates

The behavioural characteristics of obesity surgery candidates are well documented, specifically in relation to eating behaviours and weight history, but these should not be perceived separately to psychological drivers. Obesity surgery candidates have an earlier age of onset of obesity and a stronger family history of obesity than obese patients who choose other weight loss strategies (Crerand, 2006), which could point to family dynamics that facilitate obesity.

Obesity surgery candidates typically have a history of successive failed weight-loss attempts over a prolonged period of time which have often resulted in additional weight gain (Gibbons et al., 2006; Wilding, 2007) so may perceive their weight to be out of their control. Pharmacotherapy (e.g. orlistat) combined with dieting typically results in weight loss of about 10% of initial body weight, but this is not sufficient to improve the health and quality of life for the severely obese because they need to lose more weight than this (James et al., 2000, cited in Gibbons et al., 2006) and the weight is likely to be regained when the treatment is terminated. This could add to the self-perception that their weight is beyond their control. Christodoulou (2010) conducted a meta-analysis of the literature on the association between lower IQ and obesity and suggested that intelligence impacts on will-power, which in turn impacts on a person's ability to lose weight and maintain the weight loss.

In terms of eating behaviours in obese patients presenting for bariatric surgery, Fabricatore et al. (2006) found 5 factors that explained the behaviours. These comprised eating in response to negative affect, eating in response to positive affect and social cues, overeating with impaired appetite regulation, over-eating at early meals and snacking. All

except for eating in response to positive affect were strongly associated with symptoms of depression, suggesting that depression may play a strong role in weight gain and maintenance for the severely obese. These findings are supported by Facchiano, Scaringi, Quartararo, Alpigiano, Liscia, Pavoni, et al., (2013), who suggest that there is a high prevalence of inappropriate eating behaviours in obesity surgery candidates such as excessive snacking and sweet eating and gorging along with hyperphagia, where the individual experiences an extreme unsatisfied need to consume food to the point of pain or vomiting.

In terms of the reasons for opting for surgery as a means of weight loss, Brantley, Waldo, Matthews-Ewald, Brock, Champagne, Church, et al., (2014) found that the top 3 reasons that patients gave for choosing obesity surgery were health, current medical conditions and fitness. However, these medical outcomes could be achieved by traditional weight-loss methods, so it does not fully explain the rationale for choosing a surgical intervention.

Ogden, Clementi and Aylwin (2006) found that bariatric surgery patients chose surgery for psychological reasons because they felt that they could not self-control their eating behaviours and subsequent body weight, so they wanted the imposed control and limited choice of post-surgery. They reported experiencing an increased sense of power and self-control from the limited choices available. However, bariatric surgery is not an alternative to dieting; it is best understood as a method of enforced dieting (van Hout, Jakimowicz, Fortuin, Pelle, & van Heck, 2007).

General patients in primary care reported that they believed that their primary care physicians could help them lose weight, but this had not been addressed (Potter, Vu & Croughan-Minihane, 2001). This suggests that obese patients would like someone else to take responsibility for their weight loss, and that they believed the power of doctors to have a magic bullet to take the problem away. Bariatric surgery candidates may have unrealistic expectations about the outcomes of surgery, as they were found to have significantly higher weight loss expectations one year post-surgery than was clinically expected within one year (Price, Gregory, & Twells, 2013).

Psychological problems appear to be more prevalent in morbidly obese patients presenting for bariatric surgery than in a non-obese population, but the psychological discomfort has been found to have decreased at one year follow-up (Guisado, Vaz, Lopez-Ibor, & Rubio 2001), so may be associated with the negative effect of obesity stigma. Weight stigma has been found to be detrimental to mental and physical health and deplete self-regulatory resources necessary for weight control (Major, Eliezer, & Rieck, 2012) so could be implicated in patients' inability to lose weight by traditional means.

Hayden, Murphy, Brown and O'Brien (2014) suggest that the prevalence of psychiatric co-morbidities in obesity surgery candidates may be significantly underestimated because often the eligibility criteria for surgery is psychological stability, so candidates under report the symptoms in order that they can access surgery. They found that mood disorders and anxiety disorders were the most prevalent psychiatric co-morbidities, and while the prevalence decreased post-operatively, it was not significantly related to weight loss.

Guisado and Vaz, (2002) demonstrated heterogeneity of personality traits among bariatric surgery patients, specifically in relation to a hypersensitivity of criticism and difficulties in showing aggressive feelings, concluding that further research should be conducted into personality traits before and after surgery. They found evidence of a specific personality pattern but this was assessed using the Million Clinical Multi-axial Inventory-II (Million, 1987), which was normed on clinical populations so was not meant for this type of sample. Costa and McCrae (1995) argued that personality disorders are simply extremes of standard personality traits, so the Five Factor Model of personality was used to assess personality in the current study.

Davis and Carter (2009) found that compulsive overeating had similarities to conventional drug addiction in respect of clinical features and biological mechanisms. Christodoulou (2010) found that obesity has many of the aspects associated with an addiction and therefore recommended that the brain processes involved in treating addiction should be considered when treating obesity. Obese people cannot abstain completely from food in the same way that an addict can go 'cold turkey', but perhaps bariatric surgery replicated this process somewhat because after surgery the amount that a patient can eat is very limited.

Role of binge eating in weight management for severely obese populations

Binge eating is defined as the consumption of an objectively large amount of food accompanied by a psychological sense of loss of control over eating. Recurrent episodes of binge eating are the core feature of binge eating disorder (DSM-5). The prevalence of binge eating disorder in those seeking treatment for obesity is thought to be between 5% and 10% (Fairburn & Harrison, 2003) but this increases to between 18% and 20% in an obesity surgery population (Diaz, Folgueras, Herrera, & Sosa, 2012). Moreover, a high proportion of weight-loss surgery candidates without binge eating disorder report regular episodes of binge eating (Macias & Leal, 2002), suggesting that binge eating may be an important factor to consider in an obesity surgery sample.

Binge eating is implicated in the failure of traditional weight-loss treatments and may also negatively impact on surgical outcomes. However, De Zwaan et al. (2003) suggest that previous studies have produced ambiguous findings concerning the importance of binge eating as a predictor in weight-loss surgery outcomes. Thus, this study must address the role of binge eating in mediating the success or failure of weight-loss treatments and the subsequent effect on SWB.

There is evidence of comorbidity between depression and binge eating, with depression having been identified as a key factor in the maintenance of binge eating symptomology in both men and women (Mazzeo et al., 2006). Grilo et al. (2005) also found that binge eating was significantly positively correlated with depression, along with body image dissatisfaction, and negatively correlated with self-esteem. Furthermore, Diaz et al. (2012) suggest that comorbidity of binge eating disorder in obesity surgery patients

constitutes a distinct sub-group of patients with more severe psychopathology. Therefore, the relationship between depression, binge eating and SWB must be explored in this study.

Historically, binge eating has been identified using in depth interviews, but a number of self-report instruments have been devised and validated. Kalarchian et al. (2000) compared the Eating Disorder Examination Interview (EDE) with the Eating Disorder Examination-Questionnaire (EDE-Q) and found that subscales of the EDE-Q were significantly correlated with the EDE interview, suggesting validity. De Zwaan et al. (2003) also compared interview and self-report measures and found that the interview-based approach inhibited participant disclosure as participants were more honest in the anonymous questionnaire. This suggests that enhanced disclosure in self-report measures may be an advantage. Elder et al. (2006), in a comparison of two self-report instruments for assessing binge eating, found that the EDE-Q (Fairburn & Beglin, 1994) appeared to differentiate adequately between non-bingers and bingers, suggesting that it may be an appropriate measure for this study.

Binge eating may be a factor in the failure to maintain weight-loss for some bariatric surgery patients, so Allison, Wadden, Sarwer, Fabricatore, Crerand, Gibbons, et al. (2006) used both interviews and self-report questionnaires to screen for BED in patients seeking bariatric surgery. They found that the interviews generated a prevalence of only 6%, much lower than previous studies, while the self-report measures generated a prevalence of 19%, similar to the prevalence reported in previous studies. This discrepancy within the same cohort has been explained by patients possibly under-reporting during interviews due to a fear of being denied surgery because of psychological issues. This provides further support for the use of the EDE-Q in this study.

Kalarchian et al. (2000) found that it was particularly difficult to assess binge eating in severely obese weight-loss surgery candidates, as they would also consume excessively large amounts of food while engaging in non-bingeing eating behaviour. They also found that the EDE-Q was useful as it allows assessment of subjective binge episodes, which bypasses the difficulty of discriminating between amounts of food for bingeing classification. The subjective aspect of this measure also means that subjective bingeing after weight-loss surgery could also be measured, as it accommodates feelings of loss of control for a smaller amount of food when the stomach capacity has been reduced. De Zwaan et al. (2004) found that post weight-loss surgery patients found it difficult to identify an "objectively large" amount of food for their reduced stomach capacity, so an instrument that measures subjective feeling of loss of control, rather than actual amount of food consumed, would be useful for this cohort.

Research suggests that hunger can affect participants' responses on self-report measures of eating behaviour, with hungry participants scoring significantly higher than satiated participants (Evers, Stok, Danner, Salmon, de Ridder & Adriaanse, 2013), which questions the validity of self-report measures when these visceral bodily states have not been controlled for. However, Witt, Raggio, Butryn and Lowe (2014) evaluated the influence of hunger and exposure to palatable food on self-reported hedonic appetite, and found that the results were not confounded by whether or not the participants have just eaten or have been exposed to food, and that individual differences in exposure to food in the immediate environment are unlikely to confound research using these measures.

Obesity surgery participants in the current research will be screened for binge eating using the Eating Disorder Examination-Questionnaire (EDE-Q; Fairburn & Beglin, 1994),

and it is predicted that binge eating will be implicated in SWB for many severely obese participants, both before and after weight-loss interventions.

Impact of Obesity Surgery

Obesity surgery has been found to lead to improved physical and psychological well-being, with Grapsa, Tan, Paschon, Kalogeropoulos, Shimony, Kaier, et al., (2013) clearly concluding that "bariatric surgery is the most effective treatment option for obesity" (p1228). In addition to the well documented evidence for health improvements following obesity surgery, they cite evidence of post-operative physical improvements to the pulmonary vascular system, suggesting a reduction in the risks of coronary heart disease and a reversal of sleep apnoea. Obesity surgery has also been found to improve the patients' psychosomatic condition, as well as their quality of life during the first 2 years after surgery, with the more weight patients lost, the more their quality of life improved (Mamplekou, Komesidou, Bissias, Papakonstantinou, & Melissas, 2005). However, patients are not equally successful in terms of maintaining weight-loss (van Hout, Jakimowicz, Fortuin, Pelle, & van Heck, 2007) so the influence of individual differences should not be overlooked.

The long term efficacy of bariatric surgery is predominantly determined by compliance with dietary rules in which psychosocial factors play a major role, but post-operative psychological support is not frequently available (Van Hout et al., 2003). When patients initially experience rapid weight loss following surgery they tend to be motivated to adhere to the diet restrictions of surgery, however, when they experience a less rapid weight loss or plateau, they often lose the motivation and begin to eat more, or more inappropriately, so can begin to regain weight (Saunders, 2004). This highlights the role of psychological factors in the success of obesity surgery.

Facchiano, et al., (2013) found that inappropriate pre-surgical eating behaviours do not represent reliable outcome predictors in obesity surgery, so should not be used as selection criterion for surgery. However, the type of surgical procedure undertaken appears to influence adherence to dietary restraints, with stronger compliance to surgery relying on mal-absorption or neural-hormonal changes rather than restriction alone. LeRoux, Bueter, Theis, Werling, Hutan, Lowenstein, Athanasion, et al. (2011) found that the gastric bypass changes food preference to a healthier diet with the effect that they had a smaller proportion of less high fat food in their diet 6 years after surgery. Furthermore, Graham, Murty and Bowrey, (2014) found bariatric surgery patients who had undergone a gastric bypass experience sensory changes in appetite, taste and smell, with 73% reporting an aversion to specific foods, which were mainly meat based products. They also found that those who experienced the food aversions lost more weight and maintained the weight-loss better than those who did not experience food aversions. However, a different picture emerges when the eating habits of gastric band patients are examined one year post-surgery. It was found that their eating habits had not changed since pre-surgery, with a high proportion of low-quality food high in saturated fat being consumed. Because of the surgery, the total food intake was reduced, but their diets were nutritionally deficient (McGrice, & Porter, 2012).

Age is also a factor that influences surgical success, with Favia, Pestana, Preto, Guimaraes, Taveira-Gomes and Calhan, (2014) finding that the patients age was negatively associated with post-operative weight-loss. They also found that there were significantly lower fasting glucose levels in younger patients, suggesting a biological mechanism for the faster weight loss in younger patients. However, eating habits are less well established in younger patients' so they may find changing behaviours easier than older patients.

Regular exercise is a significant predictor of weight-loss maintenance, but take-up of exercise is low. Herman, Carver, Christou and Andersen (2014) examined the prevalence of post-operative exercise and found that only 48% of bariatric surgery patients reported taking any post-operative exercise. They found that this has no impact during the initial weight-loss period, but those doing exercise did not regain the weight as quickly. Peacock, Sloan and Cripps, (2014) examined barriers to post-surgical exercise and found that 78% of non-exercising respondents reported at least 1 motivational reason. However, bariatric surgery candidates rarely have a history of regular exercise so it is perhaps unrealistic to expect a behavioural change to occur without a direct intervention to increase motivation to exercise. Baillot, Asselin, Comeau, Méziat-Burdin and Langlois, (2013) examined the relationship between excess skin following weight loss, which is prevalent in over 70% of obesity surgery patients, and exercise. They found that a large proportion of women with excess skin avoid physical activity because of embarrassment about their excess skin. They found that the magnitude of excess skin was a less reliable predictor of behaviour than psychosocial inconveniences. This suggests that the barrier to exercise has less to do with the physical aspect of the excess skin and more to do with the fear of being judged because of it.

In conclusion, there are physical factors that predict the outcomes of obesity surgery, specifically in relation to diet and exercise, but much of the published studies highlight the need for focusing on the cognition of obese people, in both adults and children. The obesity surgery procedures are only one phase in a long-term plan in which the obese patient should take responsibility if they are likely to be successful (Christodoulou, 2010).

Chapter summary

The current research programme examines the relationship between obesity and SWB across the life-span, and this chapter examines the experience of those who have attempted repeated failed weight-loss attempts over a long period of time that have led to a degree of obesity that requires a surgical intervention. This occurs when the recommended weight-loss target 2lbs (1kg) per week associated with traditional weight-loss strategies would result in the individual suffering serious health consequences because of the extended time period required.

SWB is an appropriate construct for this cohort because of its strong relationship with personal goal strivings (Emmons, 1986). Positive affect has been associated with past fulfilment and future success, negative affect has been associated with low probability of future success, and striving importance and the ability to succeed are the strongest predictors of life satisfaction. Diener and Fujita (1995) found that resources correlate more strongly with SWB when they are relevant to an individual's ideographic personal strivings. A tendency was found for people to choose personal strivings for which they have relevant resources, and the degree of congruence of the individuals' goals with resources was predictive of subjective well-being. Given that the personal striving of significant weight-loss in obesity surgery candidates has historically been associated with failure and thus negative affect, which is then changed to be associated with future success following surgery because the individual then has the resources to achieve the weight-loss goal, it is predicted that this personal striving could be associated with post-surgery positive affect and, given its importance, could lead to increased life satisfaction.

Much evidence suggests that for many patients their psychological function improves after surgery (van Hout et al., 2007), but other findings suggest that for some patients there is little improvement or a worsening of psychological functioning (van Hout, Boekestein, Fortuin, Pelle, & van Heck, 2006). Obesity surgery candidates may need to adopt a more active role in the weight-loss process because optimal post-surgery outcomes require a lifetime commitment to lifestyle change (Van Hout et al., 2003), and that the patient needs to be psychologically healthy and motivated with appropriately aligned personal strivings. Responsibility for the success of the weight-loss surgery lies as much with the patient as the surgeon, because the surgery is simply a tool that the patient works with to manage their weight in the long term, so psychological factors must be addressed to avoid post-surgical weight gain (Delin et al., 1995). It is clear that there is a bi-directional relationship between psychological factors and the efficacy of obesity surgery, with psychological factors both influencing and being influenced by the surgical outcomes, so the current study will investigate the factors that help or hinder psychological functioning for bariatric surgery patients.

The current research programme takes both an ideographic and a nomothetic approach to data collection and analysis. The programme begins with a qualitative analysis of in-depth unstructured interviews with a small number of participants, followed by a longitudinal qualitative study of a married couple who undertake surgery together, and the key findings from these studies are then tested across a larger cohort using a quantitative on-line approach.

Research programme with obesity surgery qualitative cohort

This qualitative study aimed to explore the key psychological factors influencing subjective well-being for participants electing for obesity surgery. There has been previous research examining specific psychological aspects of obesity surgery (e.g. Herpertz et al., 2003; Kalarchian et al., 2000; Mamplekou et al., 2005) but the content of these have been limited to the narrow scope of the specific interests of researchers. The current study aimed to take a value-free approach to identify the key psychological issues for an obesity surgery cohort, as defined by the target population.

Subjective well-being is a sufficiently broad concept to approach the subject because it aligns with the personal strivings of the participants, whatever they may be. The approach taken comes from the perspective that the participant's physical weight-loss is less important than how the participant perceives themselves.

Study 5 examines the demographic features of the cohort, including obesity in childhood, experience of obesity stigma, dieting history and reasons for choosing obesity surgery. The research aims of this study were (i) to examine demographic factors to identify causes of weight gain and maintenance sufficient to warrant obesity surgery, and (ii) to understand the motivation to choose a surgical treatment for obesity rather than a less invasive alternative.

Study 6 examines the relationship between obesity surgery and aspects of subjective well-being, including the longitudinal effects to establish the long-term impact of obesity surgery, including sexual identity, openness to experience, post-operative psychological support and long-term weight loss. The research aim of this study was to explore changes to

SWB following surgery and subsequent weight-loss. Study 7 explores the unique dynamics of a married couple who both undertake obesity surgery together.

Methodological rationale for qualitative analysis

A number of qualitative methods were considered that were phenomenological in nature to explore in detail the personal lived experiences of the participants; these were Grounded Theory (GT), Interpretive Phenomenological Analysis (IPA) and Thematic Analysis (TA). While each of these methodologies would be adequate, there was a desire to conduct unstructured interviews rather than semi-structured interviews to allow participants to direct the discourse, and there were concerns that the rigorous structure of IPA analysis (Smith, Flowers & Larkin, 2009) may be too rigid to deal adequately with the diverse themes that may arise. Another consideration was the longitudinal nature of the data collection which is inappropriate for GT because it is most effective in studies using one-off interviews with individuals, which are then transcribed and analysed to inform the next one-off interview with a different individual, and then the process is repeated until the point of saturation (Charmaz, 2006). Therefore, after much consideration, TA was selected because it is a method ideally suited for recognising and organising patterns in content and meaning in qualitative data, and in addition to being a qualitative research methodology in its own right (Braun & Clarke, 2006), it underpins both GT and IPA. Moreover, it allows for a theoretical flexibility ideally suited to a non-directive approach (Willig, 2013), and is widely used in mental health research (Joffe, 2012).

In common with other constructionist methodologies, TA is concerned with understanding the social reality which is subjectively experienced as people go about their daily lives, so incorporates a relativist epistemology with idealist ontology, giving meaning to subjective experience rather than an absolute truth. The research questions in studies 5 and 6 relate to participants conceptualisations about how they came to a point where obesity

surgery was the answer to their condition, along with their experiences of surgery and its outcomes, and the aim was to generate themes that represent a specific pattern of meaning in the data rather than generate theory, so TA was considered an appropriate methodology. An inductive approach was taken, as endorsed by Boyatzis (1998), so data collection was non-directive using unstructured interviews, with themes grounded in the data to simply capture the meaning. Preliminary analysis followed a largely empathic approach based on manifest themes, but further analysis followed a suspicious approach based on latent themes (Willig, 2013).

Study 7 was a longitudinal case study of a married couple who were both obesity surgery candidates, and the research question concerned the dynamics of personal relationships that can help or hinder obesity surgery outcomes. The data collection method was non-directive, based on repeated unstructured interviews conducted at yearly intervals over a period of 3 years, and TA was considered an appropriate methodology because it facilitates a process of generating meaning from the data and allows for individuals perceptions to change over time. Moreover, the flexibility of the TA methodology allowed the Theory of Planned Behaviour to be applied post hoc to explain non-compliance with desired behaviour changes over time.

Method

Participants

Nine obesity surgery patients (3 males, 6 females, mean age 41.9) took part in a qualitative study based on in-depth unstructured interviews. Participants were recruited from a weight-loss surgery support group based in Liverpool (WLSInfo.org). They were selected using maximal variation sampling, and had, at the point of surgery, recorded a BMI of between 52.5 and 63.5. Two of the participants were married to each other, which provided a unique insight into weight-loss surgery within personal relationships. Time relative to surgery ranged from one week pre-operative to eighteen months post-operative. Surgical procedures undergone were gastric band, roux-en-y or duodenal switch. Participant profile characteristics at time of first interview are shown in Table 4.1.

Table 4.1: Participant profile characteristics

Identifier Number	Gender	Age	Time since Surgery	BMI Previous	BMI Current	Health Status
1	Female	42	18 months	52.5	21	Excellent
2	Female	45	10 months	58.5	39	Good
3	Male	34	11 months	63.5	37	Good
4	Male	34	11 months	62.5	53.5	Poor
5	Female	39	3 months	61.5	47.5	Very Good
6	Female	42	0 months	59.5	59.5	Good
7	Female	45	10 months	58.5	39	Poor
8	Male	42	0 months	62.5	45.5	Very good
9	Female	54	12 months	55.5	35.5	Good

Design

The study utilised a qualitative design with in-depth unstructured interviews. Data was analysed using simple thematic analysis.

Materials

The materials used for data collection comprised an information sheet (appendix 4A), a consent form (appendix 4B) and a tape recorder.

Procedure

Participants were members of a weight-loss surgery support group based in Liverpool (WLSInfo.org). Group members were told about the research at a meeting and invited to register their interest in taking part. When they registered their interest, they were given a flyer with the researcher contact details (see appendix 4C), so they could follow-up after the support group had ended and other members would not know who was taking part. They were then individually provided with information and given an opportunity to ask questions. Participants who were sufficiently mobile to travel were invited to attend Liverpool John Moores University to be interviewed; those who were less mobile were interviewed in their own homes. Interviews lasting between 1 and 2 hours were recorded and transcribed verbatim, and copies were provided to participants for their comment and approval as a process of participant triangulation. An excerpt from an interview is shown in appendix 4D. Transcripts prompted some participants to add further comments or leave telephone messages with additional information that they considered being relevant to the study, and sent follow-up letters, an example of which is shown in appendix 4E, and this has increased the contact points. Participants were invited back for subsequent interviews 6 months later, to examine changes over time. Of the 9 participants, 5 were interviewed on 3

separate occasions at 6-9 monthly intervals, 2 were interviewed twice and 2 were interviewed only once because they moved away. In all, 21 interviews took place over a period of 18 months.

Following the interviews, participants also completed a battery of questionnaires, as in the previous studies, that formed pilot data to inform a further online quantitative study, and were again invited to comment on the experience.

Ethical considerations

Ethical approval was granted from the research ethics committee at Liverpool John Moores University and British Psychological Society ethical guidelines were strictly adhered to. The ethical issues faced relate to the sensitivity of the subject and the nature of the unstructured interview. Because the interviews were unstructured it was not possible to predetermine the subjects tackled, but as it was participant led, the likelihood of subjects emerging that participants did not want to discuss was remote.

An ethical issue addressed related to the participants all being recruited from a small support group, which could have led to participants being under pressure from other members to discuss specific issues or to withhold specific information. However, participant selection was done outside of the support group at a later date, so group members did not know who was taking part and participants did not know who else was taking part.

A further ethical issue was in relation to 2 participants being married to each other and the skill of the researcher in being able to manage the interviews with 2 participants together (they wanted to be interviewed as a couple). The researcher is an experienced

counsellor with some experience of couple counselling, so was considered to have an appropriate level of skill to be able to manage the interviews ethically.

Indicative results

The interviews provided a candid and comprehensive history of the participants' weight issues from childhood through to the current situation. Unlike much of the previous research in this field, the interviews took place in a non-clinical setting and there was no perceived link between data and subsequent treatment options, which allowed participants the freedom to speak without censoring their thoughts, and provided a unique contribution to the knowledge.

In terms of weight gain, participants reported being overweight since childhood and frequently commented on the weight simply increasing in a way in which they were unaware, with the analogy of ageing being used. This suggested that the process of weight gain was passive rather that active, and could be linked to low self-efficacy. There was a clear link made between obesity and psychological factors, both in terms of weight gain and maintenance. The results contributed to existing knowledge by identifying the mechanisms that led to surgery success or failure, rather than simply recording the outcomes.

The research aims of Study 5 were (i) to examine demographic factors to identify causes of weight gain and maintenance sufficient to warrant obesity surgery, and (ii) to understand the motivation to choose a surgical treatment for obesity rather than a less invasive alternative. Demographic themes that emerged were childhood obesity, obesity stigma and dieting history. All participants were obese as children and had experienced obesity stigma throughout life, to an extent that it had become internalised and part of the persona. In terms of motivation for surgery, participants had extensive histories of weight-cycling and had opted for surgery as a last resort to control their weight because they felt that it was out of their control.

The research aim of Study 6 was to explore changes to SWB following surgery and subsequent weight-loss. Key themes that emerged were psychological function, sexual identity, openness to experience and post-surgical psychological support. There were significant improvements in reported in psychological function, specifically in terms of well-being, along with increased sexual confidence and a new found willingness and desire to try new things. A strong need for post-operative psychological support was identified, specifically in relation to adaptation and change. The themes of these studies are illustrated in figure 4.1.

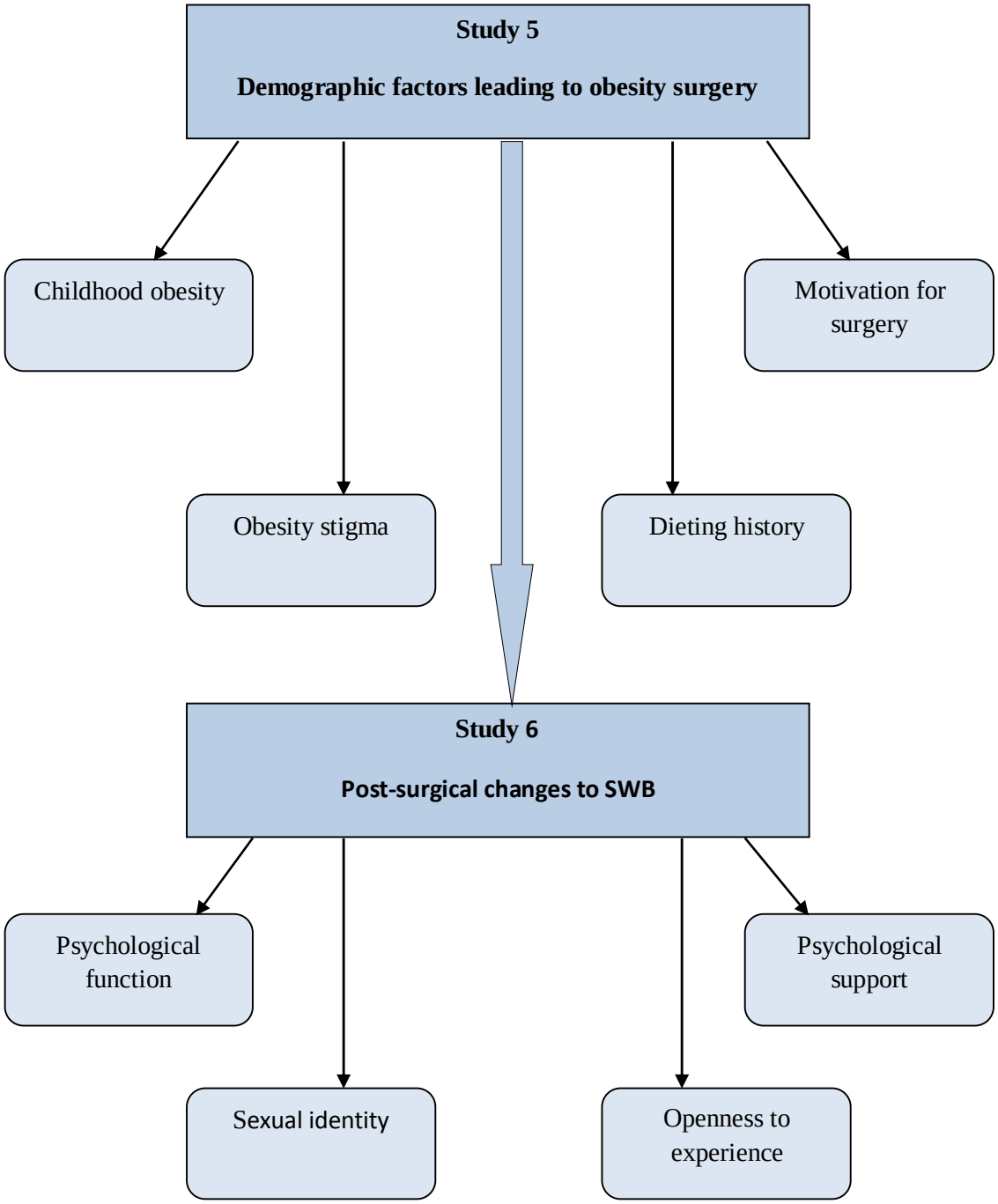


Figure 4.1: Conceptual model for study 5 (pre-surgical) and study 6 (post-surgical)

STUDY 5

Demographic factors

Childhood obesity

The age of onset of obesity in the participants supports the findings of Crerand (2006), with all of the participants reporting being overweight or obese since childhood. However, the present study went beyond the findings of the previous literature by examining participants' perceptions for the causes of the early onset of obesity, and found that either biological factors or childhood trauma were cited as the main factors. Biological factors were in relation to being part of an obese family with comments such as:

> *"The person who gave birth to me, she was very large as well . . . that's why I'm big. . . my eldest sister's big as well"*

> *"All the girls on my mums' side of the family have a weight problem. . . and have done all their lives. . . so you know, experts say it's not hereditary, well I believe that it is, because it's only the females on my mums' side that have this problem"*

The prevalence of childhood trauma in this study was high, with only 1 participant not referring to trauma as a cause of obesity, which could go some way to explain the high prevalence of emotional eating in obesity surgery candidates found by Fabricatore et al., (2006). The most prevalent childhood trauma cited that led to obesity was related to the abandonment by one parent, leading to changes in the home environment, and turning to food for comfort because it was the constant, unchanging mechanism by which the remaining parent demonstrated their love.

> *"I think being big, it was psychological. I think it was the fact that all my friends had their mums and their dads"*

The process of food being a mediator of maternal love was particularly strong in one participant who experienced the emotional loss of her mother following the death of her brother when she was 7:

> *"I watched my younger brother fall to his death when I was 7. . . up until then I was a normal sized child. . . what my mum did, which was the only thing she knew how, was to feed us . . . I was sent to a psychiatrist at 10 (pause), erm, to see why I had such eating problems"*

This participant goes on to explain how the void left by her brother was filled by food, and she seems to have replicated the pattern of loving her own child with food. She is adamant that this is not the case, but her daughter was a 28 stone teenager and underwent obesity surgery at age 18. For one participant the experience of sudden weight gain as a child was related to becoming bigger and stronger, to provide a protective shell following sexual abuse:

> *"And when I suffered, erm, child abuse and (pause), my father basically, erm, prostituted me to his best friend, and erm (pause), since then, the weight's just piled on. So, I've got a photo, I was erm, 9 and a half, and I was then absolutely normal . . . no problems . . . And then erm (pause), from then, you can just see me getting bigger and bigger throughout the photos . . . and to me like my weight is definitely a-a protective thing . . . You know, you can't fancy me if I'm fat"*

Irrespective of the perceived cause of obesity in childhood, all participants reported that it impacted negatively on their childhood because of social stigma and began the process of withdrawal from society:

> *"I missed out on so much. You know, school trips (long pause), I didn't go away with the school . . . I was too self-conscious, didn't want to do it"*

> *"I didn't make friends, I made friends but never-never kept them . . . because I wouldn't participate in, and then they stop asking after a certain amount of time"*
>
> *"Dropped out of school early because I just couldn't bear the taunts, of-of other girls"*

The participants described themselves as powerless and stigmatised as children, and it could be that those feelings of powerlessness have perpetuated into their adult lives in respect of experience of stigma and not having control over their weight.

Obesity stigma

Without exception, all participants reported experiencing stigma associated with obesity and the discrimination experienced appeared to be pervasive, supporting the findings of previous literature (Azevedo et al., 2013; Klein et al., 2009). Most participants reported anger at the acceptability of discrimination on the basis of body weight, but some had internalised the discrimination and felt that they deserved it because they were responsible for their own weight, to the extent that they had accepted the character deficits cited in the literature (Latner et al., 2012):

> *"Well it's my own fault, I've led a lazy sedentary lifestyle, ate the wrong foods"*

Discriminatory comments took the form of both deliberate malice such as, *"oh look at that fat c**t"*, and accidental insults, such as the following comment made by a colleague of a participant in an attempt to be friendly, the message being that they are not as bad as the 'usual' obese people:

> *"I mean, for a big lad like, you know, you're quite clean aren't you, you don't smell or nothing like"*

These types of taunts and stigma often led to participants reporting that they felt worthless and not a valued part of society:

> *"You feel worthless, you-you don't feel, well you do, you do feel as if you are not worth (pause) as much as other people because you're heavy. . . you do have those negative feelings"*

Participants reported taking steps to avoid the abuse, which removed them even further from general society and prevented them from transitioning through the usual phases of life:

> *"In the past there have been romantic liaisons where I've not pursued it because I'm concerned about getting naked and my*

> *weight and . . . you're feeling worthless as a human being . . . like, how can she, how can she possibly fancy me? Look at me . . . I've always felt like that . . . that held me back . . . I never led a normal teenage life . . . not at all (long pause), and you know, I was, I was in my mid 20's before I went with women"*

The withdrawal from society extended to eating behaviours, with participants reporting feeling extreme discomfort at being seen eating in public or even at a romantic date:

> *"If someone said to me, "Would you like a seat by the toilet door or a seat by the window," I'd always have the seat by the toilet door. I always feel, I-I-I always feel conscious eating in front of people"*

> *"We'd just go for a drink and have a drink, or we'd go for a meal and have a meal an' all that. And I felt self-conscious about me eating in front of him, because of my size"*

This clearly illustrates the extent to which the obesity surgery participants felt excluded from society because it goes beyond activities associated with the physical limitations of obesity, and into all spheres of life.

Dieting history

Participants were very aware of the negative impact that obesity had on their lives and all had an extensive diet and exercise history that resulted in repeated bouts of weight cycling, where large amounts of weight was shed and then regained. Participants had all joined a gym at some point in the past, but had failed to maintain the membership because they felt inadequate and unsightly around the slimmer members. One participant had even engaged a personal trainer, but to no avail. The history of diet-based weight-loss strategies ranged from fad diets to calorie controlled diets, although one client reported being too embarrassed about her weight to attend Weight-Watchers meetings:

> *"I'd actually do Weight-Watchers by myself . . . I hadn't gone to any of the groups . . . 'cos I won't tell anybody my weight . . . I won't go to any of the groups or anything"*

There was also an extensive history of drug-based interventions including vitamin supplements (bought from the internet), amphetamine based drugs (bought from a 'slimming doctor' in Rodney St.), Lofepramine and similar anti-depressants where appetite suppression is a known side effect (prescribed by GP), Sibutramine (prescribed by GP), Guar Gum and similar bulking agents (bought from the internet), and the most popular drug, the fat-binder Orlistat (prescribed by the GP). All of the drugs eventually failed to help the participants maintain the weight-loss, either because they simply didn't work or because of side effects including dizziness, sickness, rashes and an inability to sleep. The most common side-effect was faecal incontinence which was found with Orlistat, as illustrated in the following quote:

> *"You know the first time that that happened (faecal incontinence)? I just sit around the house wearing nothing and I was sitting on the computer chair, farted and oops! It's a good job it was like, you know, a faux leather chair"*

This participant was so desperate to lose weight he continued on the medication for 18 months and bought wipe-clean furniture to cope with the incontinence, but the weight shed was quickly regained when he stopped using the medication. This drug works by binding 30% of the fat in the diet to waste products, so it is eliminated rather than absorbed, and 'greasy stools' are an expected outcome. This is meant to create an aversion to including fat in the diet, but for these obesity surgery candidates, it instead created an aversion to the drug in the long-term. This side-effect led participants to be afraid to leave the house so they all stopped using the drug.

Eventually, participants chose obesity surgery as their final option and it was perceived to be an intervention to be tried in much the same way as the previous interventions. Surgery was perceived as a potential mechanism for controlling their weight because they felt unable to control it themselves, supporting the previous findings of Ogden et al., (2006).

Motivation for surgery

Without exception, every participant cited health reasons as their primary motivator for obesity surgery, supporting the findings of Brantley et al., (2014). Participants had multiple health issues related to their level of obesity and these included hypertension, migraine, sleep apnoea, diabetes, depression and poor mobility. However, social and psychological motivations very quickly became apparent:

> *"I want to be able to do everything that you can do, and I can't, so that's why I'm having this surgery"*

> *"I-I'm not, I'm not living this life . . . I can enjoy myself but (pause), I've always, like it was always like a spectre lurking in the back of my mind, you know, you're too fat, you can't be having fun . . . and I just said to myself, I've had enough of this"*

One participant discussed the issue of image, and how one looks, being an important social factor in Liverpool when compared to a district she had previously lived in, and this being a motivator for surgery:

> *"But if I still lived in Winsford I don't think I'd have bothered having it (surgery) done because image doesn't matter . . . because they're so (pause), obviously they have styles and fashions the same as everywhere else but . . .I don't think the way you look is as important"*

Therefore, reasons for choosing obesity surgery were multi-faceted, and perhaps the reason that health was repeatedly cited as the primary motivator was linked to this being socially accepted rationale and the predominant eligibility criteria for surgery in the NHS NICE guidelines.

Discussion

Results indicate that participants had all experienced childhood obesity and had a strong family history of obesity, supporting the findings of Crerand (2006). However, the current study goes beyond the existing knowledge by establishing the causes of obesity as perceived by the participants, which is important because it has implications for the success or failure of treatment options. The participants strongly endorsed a biological perspective, believing that their obesity was genetic and pointed to other family members who were also obese as evidence to support their position, while discounting social factors such as other family members also being obese because they shared the same lifestyle. Seven of the nine participants had at least one other close family member who had also undergone obesity surgery, a factor that was perceived as further support for the biological nature of their obesity. The endorsement of the biological perspective supports a psychological position based on powerlessness with obesity being perceived as outside of the control of the individual, so it removes responsibility for obesity from the individual and legitimises continued overeating and subsequent weight gain or maintenance. Hence, treatment options must take account of this perspective and include interventions to increase acceptance of responsibility for obesity.

An alternative cause of childhood obesity that emerged from the data was childhood trauma. Prevalence of experience of childhood trauma as defined by the participants was extremely high, and it was associated with emotional eating and subsequent weight gain. While the association between childhood abuse and obesity surgery is well established in the literature (Sansone, Schumacher, Weiderman, & Rontsong-Weichens, 2008), the accepted prevalence of between 25% (Sansone et al., 2008) and 61% (Salwen, Hymouitz, Vivian, & O'Leary, 2014) is lower than in the current study, this could be due to the

definition of abuse or trauma. Previous studies have typically included physical, emotional and sexual abuse as forms of childhood trauma (Striegel-Moore et al., 2002; Liebenberg, & Papaikonomou, 2010); however participants in the current study included the loss of a parent (physically or emotionally) in their definition of childhood trauma. This has far reaching consequences as there are nearly 1.9 million lone parents with dependent children living in the UK (Statistical Bulletin, 2013), so if even a small proportion of these children turn to food for comfort in response to the loss of a parent, the number of obese children will be substantial.

Childhood obesity was found to be strongly associated with social stigma, withdrawal from society, and feelings of vulnerability and powerlessness; themes that would also persist into adulthood. Participants reported being on the margins of society because their obesity rendered them socially unacceptable, and while the stigma of obesity in childhood is well documented in the literature (Puhl, & Latner, 2007; Sjoberg et al., 2005), the notion of the obese children choosing to operate as a separate social group to protect themselves from stigma is novel and could explain the relationship between poor academic performance and childhood obesity (Christodoulou, 2010), with obese children withdrawing from school-based activities. The feelings of shame and subsequent withdrawal from society extends across all life domains including fear of being seen eating, a factor that indicates a symptom of the sub-scale 'Shape Concern' on the Eating Disorders Examination Questionnaire (EDE-Q, Fairburn, & Beglin, 2008).

In accordance with previous literature (Gibbons et al., 2006; Wilding, 2007), participants reported extensive histories of dieting and weight-cycling. Participants were desperate to shed body weight but felt powerless to succeed, often citing biological factors

as barriers to success. They held stable attributions about being disempowered to act in this respect, but believed obesity surgery to be the key to change their (perceived) biological predisposition for obesity, and held equally stable attributions about the power of surgery.

STUDY 6

Correlates of subjective well-being and obesity surgery

In line with previous research (Guisado et al., 2001; Hayden et al., 2014), results suggest an overall trend of improved psychological function post-surgery, with the most improvement being reported by participants who had lost most weight. However, the longitudinal aspect of the study, taken over a period of 18months, appears to suggest a consistent pattern of change in SWB over time that goes beyond the simplistic linear explanation that sustained incremental weight-loss is associated with sustained incremental improvements in psychological function. The pattern that emerged demonstrated a fluctuation in mood states, in respect of a period of euphoria directly after surgery, followed by a period of uncertainty and low mood, followed by a period of increased psychological well-being and resolution. This is illustrated in Figure 4.2.

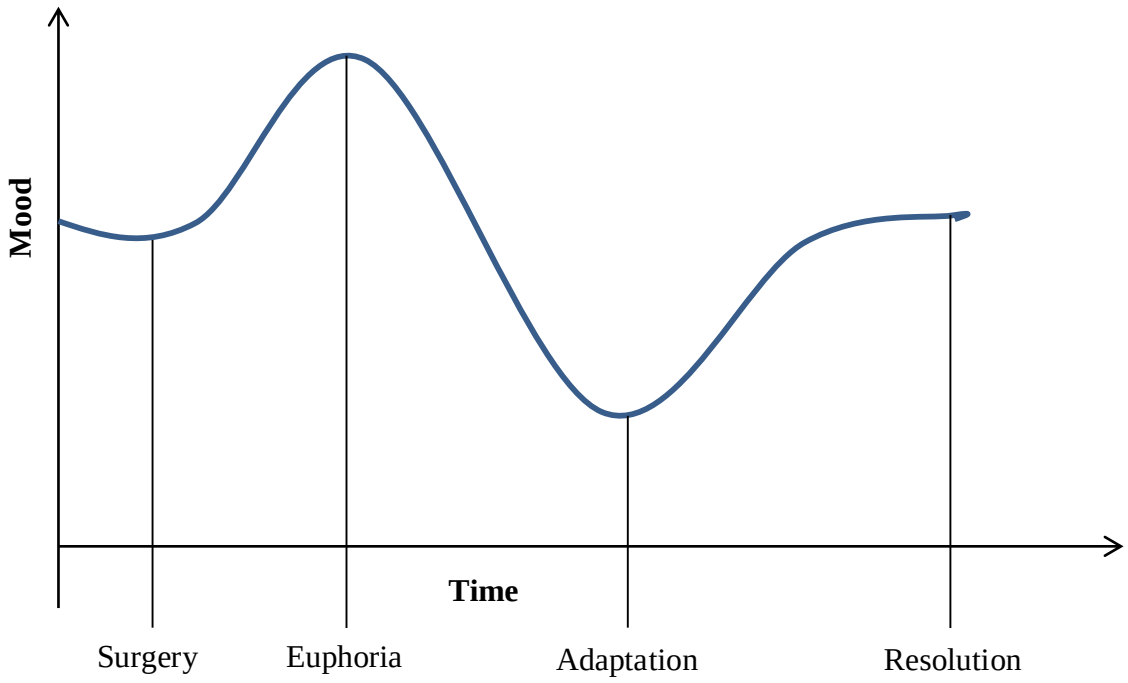


Figure 4.2: Conceptual model of mood relative to time

The initial euphoria is attributed to rapid weight-loss post-surgery; the subsequent uncertainty is attributed to adjustment to the loss of using food as a coping strategy, and the increased psychological well-being is attributed to improved physical functioning following weight-loss. This is illustrated in the following quotes from the same participant at different phases post-surgery:

> *"I know it's a good thing for me to do. I'd love to be able to fast-forward a year . . . I'm impatient. I'm 3 months gone, and 6 stone down" (1st interview)*
>
> *"I felt a deep despair, it just came over me and I couldn't shake it, can't explain why . . . and I couldn't turn to food for comfort" (2nd interview)*
>
> *"Well it's not saved my life, it's given me a life. I can do 'normal' stuff, be part of society" (3rd interview)*

There also seems to be a period of understanding whereby participants come to realise that the surgery cannot solve all the issues around self-esteem, coping and depression, and that the surgery is simply a tool to help with the weight-loss rather than the whole package:

> *"I certainly feel better about myself . . . but I don't feel good yet . . . It's (pause) well you know I had the depression before . . . it's not sorted out yet I still can't (pause) get good feelings about myself all the time . . . you know things like (pause) situations that happen erm I can't cope with them in the same way that I used to be able to . . . I don't know if that's directly involved with the obesity or just because the obesity was part of the depression in the first place"*

Interestingly, all of the participants had previously taken anti-depressant medication, but the post-operative participants no longer did so, and then anti-depressant use was resumed at about 1 year to 18 months post-op.

The factor that participants attributed to having the greatest impact on SWB was increased participation in society following weight-loss. The psychological categories that mediated participation in society were identified as confidence, self-esteem, optimism, self-efficacy, sexual identity and openness to experience. Participants typically reported changes in self-esteem in terms of a reduction in shame and being visible in society

> *"I was always trying to merge into the background, always hoping nobody would see me, so I didn't get bullied. The worst was when a car slowed down so the driver could shout 'fat bastard' at me when I was with my daughter. I felt so ashamed. Not any more, now I walk with my head in the air."*

> *"I used to hate walking into a room full of people. I'd ask someone to walk in front of me so I could hide behind them. Now I don't care, I'm as good as anybody else and if they don't like me that's their problem."*

> *"I feel better about going and meeting people now which is why it was easier to change jobs because (pause) . . . I feel more accepted now, people don't look at me in the same way"*

Participants reported being more optimistic in life as a whole, and this was often related to lack of depressive symptoms and a sense of freedom:

> *"I just think to myself, the future's bright, I've gotta wear shades here."*

> *"It's like I've spent my whole life in a wheelchair and now I can walk for the first time."*

> *"The world's a brighter place now, that black cloud that was always following me around has finally gone and everything just seems easier somehow."*

Participants reported changes in self-efficacy in terms of taking control of their lives, and adds further support for the findings of Ogden et al., (2006).

> *"I feel like I'm in control of my life for the first time in years. My weight has always controlled me, and now I can control my weight."*
>
> *"I've never worked, not ever. I left school early because I was being bullied about my weight, so I didn't do any exams. I've got no qualifications. I've always just been a carer, first for my mum and then for my kids, but I've never ever earned a wage, didn't think I could. Now I've got my first job and I'm so excited. I know I can do a good job."*

This experience of taking control and exploiting the positive effects of the surgery to make changes in life was much stronger in the 2 participants who took personal loans to fund the surgery than in the 7 participants who were funded on the NHS. Although all participants encountered a personal struggle to access surgery, with the NHS participants often fighting for several years to get funding for the surgery from the PCT, there is a clear difference in outcomes between those who self-funded and those who did not. This difference perhaps links self-funding being associated with increased ownership of the process and a sense of taking action rather than being a passive recipient of surgery, and has implications for clinical practice.

Sexual identity

An important area of post-surgical development for participants was in relation to becoming more aware of their own sexual identity, and this is an area that has not been addressed in the literature. With the exception of the male in the married couple, who had very low testosterone so could not maintain an erection (nothing to do with the surgery) participants reported an increasing libido and started to think of themselves as sexual beings as they lost weight. This was an area of life that had been somewhat limited for this obese cohort, either by physical limitations or psychological limitations:

> *"I used to feel like a frump and now I feel like a goddess. I'm actually flirting for the first time in my life."*

> *"I am going to live the teenage years I never had. Women have never really seen me as a sexual person, just always as a friend, so now I intend to make up for lost time."*

> *"I've never really thought of myself as sexy, but I'm starting to now"*

> *I've got all sexy underwear an' all that sort of stuff, but I've had it for a while . . . he (husband) bought me some at Christmas, and I was like "I'm never wearing that!" So like, black satin and all that, Oooh! But I tried it on the other day and it actually felt quite good, an' he was like "Wow! Come here!"*

In addition, a male participant reported increased sexual confidence because his penis was becoming more visible as the body fat in the surrounding area was diminishing, so he felt "*more of a man*."

> *"But one-one issue as well is . . . my weight . . . it's centred around my groin as well . . . consequently, things that should hang down, weren't hanging down as much as they should have done. So I was dead self-conscious about that . . . and even, with an erection, in a state of arousal . . . It was less visible than I would, than I what would have hoped, and I was dead worried about that, and that's changing"*

However, the participants did not always have the emotional maturity to cope with the sexual opportunities that arose because they had not participated fully in the courtship rituals that most people encounter in their teens or early twenties, and this led to some ethical difficulties in the research process. During the first interview, one of the single male participants talked about being attracted to a married female he had met at the WLSInfo support group. At the follow-up interview he reported that he had begun an extra-marital affair with her *"as a bit of fun"* until he found the right person to settle down with. The married female was also a participant in the research programme and at her second interview she reported that she was going to leave her long-standing marriage, which she had previously described as stable and supportive, for *"the man of her dreams"* who turned out to be the male participant. This mis-communication between the couple was largely due to both parties being inexperienced in recognising and understanding the intent and implications of sexual advances made by others. However, because of the strict confidentiality of the research process, neither knew that the other was taking part, so the intentions of the other party were not disclosed to either participant.

Openness to experience

Participants reported an eagerness to try new things as they lost weight along with a new found optimism. Many activities were denied to this cohort because they were excluded by their physical size, particularly in respect of fitting into seats.

> *"I'm going on an aeroplane for the first time in my life and I'm 42 years old. It's the first time I will have been able to fit in the seat, I'm so excited."*
>
> *"Instead of worrying about what's gonna happen in 25 years, I ask what can I fit into the next 25 years?"*
>
> *"New doors and new avenues are opening up for me. I've tried loads of new stuff."*
>
> *"I'm gonna buy a season ticket for the footy this year, I haven't been able to go to a match for about 10 years because I couldn't fit through the turnstiles, and I'm really looking forward to going with my brothers."*

These comments are in direct contrast to the language used in the first interviews, which focussed on all the things that they could not do and the limitations experienced in their lives, and points to an increased agency in life associated with long-term surgical outcomes.

Post-operative psychological support

Post-operative psychological support was not freely available for these participants, but results suggest a need for post-operative psychological support during the period of adjustment (a key feature of subjective well-being) as participants reported difficulty in adapting to novel eating patterns. Food consumption was clearly used as a coping strategy to *"numb the feelings"* and was frequently described as the participants' *"best friend"* which had been removed but had not been adequately replaced:

> *"Food was my best friend, the one I turned to when I was upset. It was the one I thought would never leave me, and I'm grieving for it."*
>
> *"I used to eat when I was happy, eat when I was sad, eat when I was upset. Now I don't know what to do with myself and I feel out of control."*
>
> *"I really, really miss eating."*
>
> *"Food was like a comfort blanket"*
>
> *"It was my best friend. You know? When you're at home and it's late at night, or (long pause) you've had that 'phone call or letter to say that you can't (pause) you know? You've got to do this again or that again, you know? You just go and eat because it's warming, it's comforting, it's your best friend. You know? It doesn't, it doesn't make assumptions (emphasis) about you. It's just there (pause) readily available"*

Adjustment to the post-operative diet was also an area of difficulty, with participants struggling to eat healthy food, and often reporting that their overall post-operative diet was less healthy than their pre-operative diet in terms of nutrients. This contradicts the findings from previous literature that suggested healthier post-operative food choices were made (LeRoux et al., 2011), and could be due to the research not being aligned to the surgery provider, and therefore not eliciting a social desirability bias. The poor diet is often put

down to an inability to digest natural foods such as meat and vegetables, which partially supports the findings of Graham et al., (2014) who found participants had an aversion to meat based products. However, the current study deviates from previous findings because it also found that participants substituted the difficult to digest foods with heavily processed foods such as chocolate and crisps, which compromised the weight-loss:

> *"I do try and not have as many (chocolates, biscuits and crisps) 'cos it is sad in a way that I can eat all those things and I can't eat the good things because things like meat and vegetables and pasta I find very hard to digest . . . meat I can't digest erm, pasta just lies very heavy . . . I suffer for hours afterwards if I try and eat pasta so I just don't . . . if I try and eat vegetables as part of a meal then I can't, things like cauliflower and broccoli and carrots they just lie really, really heavy and I suffer with them which is sad, because I did like vegetables"*

However, some participants acknowledged that their poor post-operative diet was psychologically rather than physiologically driven:

> *"I know that a lot of it is my own doing that I am eating the wrong things but I'm craving carbs all the time"*
>
> *"I am craving junk food, I can manage a whole Big Mac in one mouth full, which I shouldn't really be able to do"*

It is therefore possible that the post-surgical 'aversion' to specific foods reported in the literature could be a physical function of a psychological aversion to adherence to a strictly prescribed diet. Moreover, some participants struggled with what they termed 'head-hunger', whereby they felt an all encompassing need to eat despite there being an absence of physical hunger and a possible outcome of pain or vomiting, supporting the findings of Facchiano et al., (2013). The current research went beyond the existing knowledge by examining coping mechanisms to reduce 'head-hunger', and found that the participants

struggled to resist the urge to eat and instead focussed on methods of coping with eliminating the food afterwards:

> *"What I do is drink a glass of water too fast and know that that's going to make me sick because I can't keep it down"*

This, along with an inability to refrain from eating constantly, suggests the presence of an eating disorder. However, one participant was referred to an Eating Disorders Service by her GP but failed to even get to the initial consultation process because she had undergone surgery, so she was referred back to the community dietician. Her despondence felt at the outcome is evident:

> *But I need some sort of help the dieticians are useless . . . and they're not really that interested so it just feels as if there's no real support there and I'm really struggling at the moment*

The post-surgical inappropriate eating behaviours led to a slowing down of the weight-loss process, and in some cases, led to subsequent weight regain. This suggests clinical implications in respect of a need for post-surgical psychological services that could support patients through the adjustment phase, to increase the overall efficacy of the obesity surgery in the long-term.

An unexpected finding was that 7 of the 9 participants (78%) had a family member who had also undergone weight-loss surgery. Also, 2 participants (25%) reported that they felt they had an eating disorder (undiagnosed). These factors will be explored further in the online quantitative study. It is concluded that increased participation in society brought about by weight-loss surgery may result in an overall improvement in subjective-wellbeing in the long-term. This assertion will be explored further in the subsequent online quantitative study.

Discussion

The findings of this study concurred with the findings of previous research (Hayden et al., 2014) in that overall post-surgical psychological function was found to have improved. However, the current study differed from previous research because instead of using data collected from one point in time, it examined post-surgical changes to psychological health over a period of 18months with multiple data collection points. This longitudinal methodology revealed that psychological function did not follow a simplistic linear pattern; instead a pattern emerged of euphoria, followed by despair during a period of adaptation, and then improved psychological function following a period of resolution. The period of despair was associated with losing 'food' as a coping mechanism for mood management and the lack of an alternative strategy. Moreover, the pattern of mood change over time was also reflected in a changing pattern of reported use of anti-depressant medication, which typically followed a pattern of pre-surgical drug use which was stopped following surgery during the period of euphoria, and resumed at about 1 year later. This pattern of mood change over time has clinical implications suggesting that the obesity surgery process should include post-surgical psychological support to teach alternative coping mechanisms.

A further unique finding from this study was in relation to post-surgical diet. The existing literature suggests that obesity surgery candidates consume a healthy diet post-surgery (e.g. Le Roux et al., 2011) but these studies were conducted by dieticians in clinical settings. Participants in the current study disclosed that they did indeed tell the dieticians that they consumed a healthy diet (supporting the literature) because they were concerned that to report otherwise would compromise their access to clinical support, however, in reality they were mainly consuming heavily processed fat and sugar laden food such as

chocolate, confectionery and crisps, which met their psychological needs for comfort food and was easily digested. Participants also reported experiencing post-surgical hyperphagia, which is again reflected in the literature (e.g. Facchiano et al., 2013), but the current study expanded the literature by identifying that the coping methods used to manage feelings of hyperphagia were based on purging rather than restraint, providing further evidence of continued reliance on food to manage mood. The combined factors of failing to use an alternative coping strategy other than food to manage mood and the subsequent poor diet choices could partly explain the inequality in success of surgical outcomes identified in the literature (Van Hout et al., 2006).

The role of actively owning the process should not be overlooked as a factor determining the success of obesity surgery outcomes. In the current study, those who had self-funded surgery demonstrated much greater self-efficacy and determination to manage the success of the surgical outcomes than those who were publicly funded through the NHS, who took a more passive role. This finding should be treated with caution due to the very small sample size (only 2 participants self-funded). However, the finding has implications for clinical practice because it suggests that processes should be implemented to increase patient autonomy and decision-making to increase ownership of the process, and subsequently reduce self-sabotaging behaviours such as continued reliance of consumption of comfort food to manage mood.

A key contribution to knowledge from this study was identifying that post-surgical improved psychological function was due to increased social acceptance and participation in mainstream society. This impact was associated with decreased anxiety in social settings due to not worrying about physically fitting into public spaces (chairs, public toilets, etc.)

along with decreased shame at being seen in public and a subsequent increased sense of self-worth and willingness to try new things. The social acceptance experienced impacted on sexual identity, with participants experiencing being treated as a person of sexual interest, often for the first time, or for the first time in a long time. Although the participants were physically mature, they were emotionally immature when interacting with sexual partners because they had not taken part in the typical mating rituals of adolescence and early adulthood because of their obesity. This inexperience rendered the participants vulnerable to having unrealistic expectations of potential partners, which could destabilise SWB with emotions alternating between excitement, trepidation and disappointment.

STUDY 7

The dynamics of a married couple who jointly undertake obesity surgery

This longitudinal case study follows the progress over a 3 year period of a married couple who both undertook obesity surgery. They met at an NHS weight management clinic; a prerequisite process to accessing NHS funded obesity surgery. At the time of the first interview, they had been married for almost 2 years and were both about to undertake obesity surgery; the husband was at the 1 week pre-operative stage and the wife was at the 3 weeks pre-operative stage, so surgery was planned almost simultaneously. They planned to renew their wedding vows in 2 years' time when they were thinner, and have wedding photographs taken then, as photos had been banned at the original wedding because they did not want a permanent record of their size.

The research aim of this unique study is to examine the dynamics within a personal relationship than can help or hinder the weight-loss process over time, from before the surgery takes place, through the post-surgical phase, and onto the phase where the effects of surgery are embedded into life. The process of post-surgical weight-loss is examined using the theoretical framework of the Theory of Planned Behaviour (TPB; Ajzen, 1991). Key themes emerged at each point of contact that capture the process and these are illustrated in Figure 4.3.

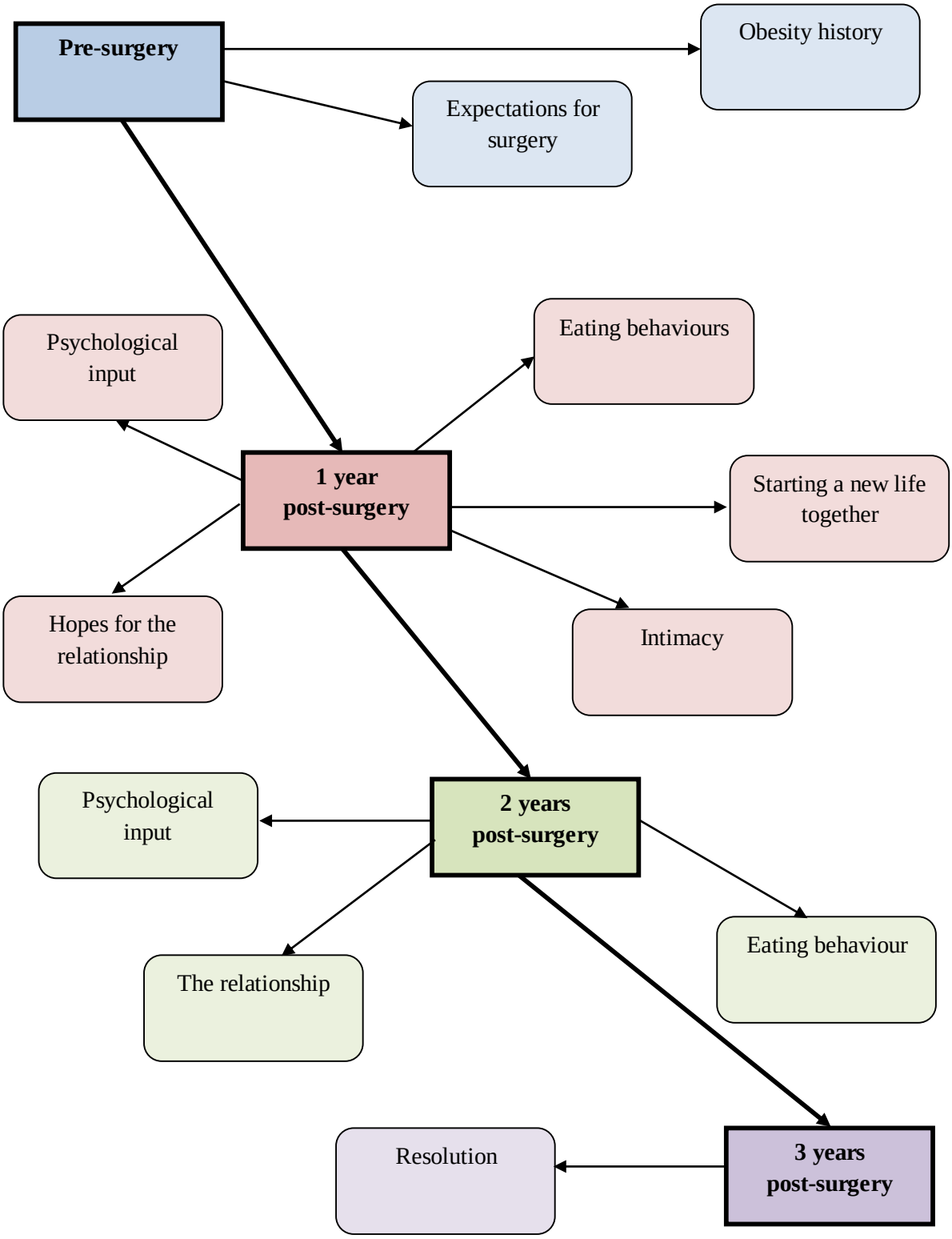


Figure 4.3: Conceptual model of longitudinal study with married couple

Theories of behaviour change

A number of theories of behaviour change including the Theory of Planned Behaviour (TPB; Ajzen, 1991), the Theory of Reasoned Action (TRA: Fishbein, & Ajzen, 1975), and the Health Action Process Approach (HAPA; Schwarzer, 1992) have previously been used to predict diet or exercise behaviour change in obese and overweight samples with some degree of success. The Theory of Planned Behaviour is the most prevalent theory used in the obesity literature and it has been recommended as a useful framework to inform weight-loss strategies in overweight and obese populations (Robertson, Mullan, & Todd, 2014).

When examining theories of behaviour change to predict exercise adherence in obese populations, the results are mixed. Belanger-Gravel and Godin (2011) conducted a systematic review of the literature and conclude that the long-term impact of theory-based interventions to increase physical activity in overweight and obese individuals remains ambiguous. However, Boudreau and Godin (2007) applied the Theory of Planned Behaviour (TPB) to predict exercise intention in obese adults, and found that perceived behavioural control and attitude were independent significant predictors of the intention to be physically active, so suggested that physical exercise interventions designed for the obese should focus on developing skills to overcome the barriers to exercise along with a positive attitude. However, it should be noted that behavioural intention does not always translate into behaviour, so Plotnikoff, Lubans, Costigan and McCargar (2013) applied TPB to an overweight/obese adolescent population, examining behavioural intent and behaviour separately, and found that attitude was the strongest predictor of intention to exercise, but perceived behavioural control was the strongest predictor of the exercise behaviour. In contrast, Palmeira, Teixeira, Branco, Martins, Minderico, Barata, et al. (2007) found that

TPB was not a strong predictor of exercise behaviour in obese populations, and suggested that research around weight management needs to take account of SWB and body image, as these constructs could offer more important insights into decision-making around weight control tasks.

In terms of using theories of behaviour change to predict dietary change, the findings are also mixed. Schwarzer and Lusczcynska (2008) applied the Health Action Process Approach (HAPA; Schwarzer, 1992) to a sample of participants suffering from obesity-related illnesses to change their behaviour by reducing the consumption of fat in their diet, and found that risk perception was the strongest predictor of intention to reduce fat intake. However, this finding may not be replicable in samples that are not yet experiencing obesity-related illnesses. Dunn, Mohr, Wilson and Willert (2011) applied TPB to fast food consumption and found that the immediate gratification of tasty, satisfying and convenient meals overrides longer-term health concerns associated with fast food, suggesting that using TPB to reduce fast food consumption may be of limited benefit. Meanwhile, Mullan and Xavier (2013) also applied TPB to dietary restraint in respect of saturated fat consumption, and found that perceived behavioural control was a significant predictor of saturated fat consumption. Moreover, Palmeira et al., (2007) found that TPB was a good predictor of dietary change.

Theories of behaviour change applied to obesity surgery samples tend to focus on physical exercise adherence rather than dietary change, because it is assumed that dietary changes have been addressed by the surgical intervention. Hunt and Gross (2009) compared the value of TPB with the Theory of Reasoned Action (TRA: Fishbein, & Ajzen, 1975) in predicting exercise adherence in obesity surgery patients at different post-surgical stages,

and concluded that TPB was a superior theoretical model for the prediction of both exercise intention and behaviour. As with traditional obese samples, perceived behavioural control was the single best predictor of both exercise intentions (Boudreau, & Godin, 2007) and exercise behaviours (Plotnikoff et al., 2013). However, subjective norms and attitudes toward exercise played a much larger role in predicting intention to exercise in obesity surgery samples than in traditional obese populations. Livhits, Mercado and Yermilov (2010) suggest that there is a critical period associated with intention to exercise in obesity surgery candidates, with intentions to engage in regular moderate exercise increasing the closer the person got to the surgery date. They therefore recommend that patients be encouraged to engage in regular mild exercise prior to surgery to maximise the benefit of the increased intention and create a subjective norm of regular exercise. Stroops and Alexander (2011) recommend targeting perceived behavioural control by setting realistic goals to increase physical activity in obesity surgery candidates who will have impaired mobility when compared to their average weight counterparts.

In the current study, TPB is used to examine lifestyle changes based on diet and exercise required to optimise surgery outcomes, and to provide a theoretical framework for explaining the dynamics within the personal relationship.

Obesity history

Both partners reported being obese children, a factor that they each linked to a coping strategy for living with an abusive parent. The husband cited the outcome of overeating, becoming bigger and stronger to create a protective shell, as the defining factor, while the wife cited the mechanism of comfort eating as the coping strategy, and the obesity as the unfortunate outcome. She also articulated the circular process whereby she would be upset, so she would comfort eat on the excess food provided by the parent and gain more weight, then the parent would criticise her for being obese, so she would become upset and comfort eat, again facilitated by the parent.

> *"I was about 10 or 11 . . . I heard my mum talking to my aunties and a couple of my cousins in the kitchen, and telling them what I weighed . . . I remember that vividly and I've never trusted my mum with anything since then . . . she's always sort of criticised me about my weight . . . and you know, she will try to force feed me. . . And (pause), you know, the more criticism I get, the more weight I've piled on"*

This mechanism was also adopted by the husband at a later date, and is shown in figure 4.4 below:

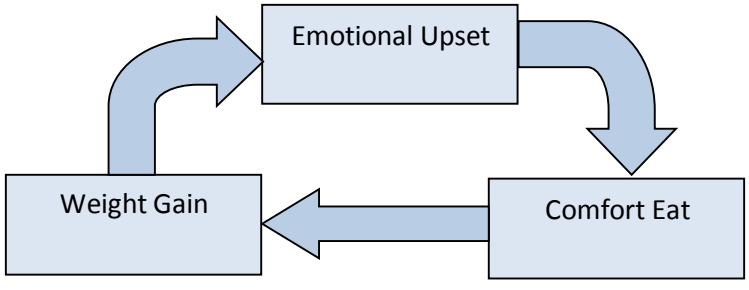


Figure 4.4: Cyclical mechanism for emotional upset and eating

This would be a pattern of behaviour that would pervade the participant's life and prevent her from taking control of her eating or her weight. This behaviour pattern was absorbed into an overall *"fat persona"* so would not seem incongruent with the lifestyle where weight gain was the norm, and there would be no necessity to change:

> *"So I suppose when I think about it logically, because I was always called fat, then (pause), you just sort of assume that persona . . . and then, and you become really, really fat. . . I've always had a problem with my weight (pause) . . . but I'd say in the last 6 years, I've probably put on about 6 stone."*

Indeed, the *"fat persona"* was so strong and pervasive for both partners that there was a danger that it could hinder the outcomes of surgery:

> *"I just can't imagine myself as being thin . . . I just can't imagine that this operation is going to have the results that I know it will have"*

There was also the reciprocal danger of post-surgical eating restrictions having a negative impact on the relationship, as eating was the main interest that they had in common. It was the bond that held them together and was summed up as *"It's our total life really."*

Both partners had a long history of weight cycling through dieting behaviours, with large amounts of weight lost and regained. They had both also used a wide variety of weight-loss drugs, with little or no long-term impact. The husband had previously been a long-term Orlistat user who had failed to change his eating patterns, but had "*lost 5 stone just eating chips"*, only to be regained when the treatment ceased. They showed a clear understanding of how their inappropriate eating behaviours increased their levels of obesity, but they failed to recognise that they were each making the inappropriate eating behaviours of the other more acceptable by condoning and copying the behaviour:

"I can eat 2 litres of ice cream . . . we both can . . . we go out and we buy, you know, big 2 litre things each, because we both like different flavours, and we'll sit and eat the whole thing . . . I mean, we get a spoon, and we get the tub . . . and we eat it 'till it's gone"

Both partners also described their eating behaviours as an addiction to food, or an addiction to using food as a coping mechanism:

M: "*It's an addiction to food, definitely, yes"*

F: *"I mean, I am a food addict"*

M: *"The thing about it, it's not just an addiction to food, it's an addiction to (long pause), dealing with other issues. You know? It's a symptom of dealing with other issues . . . You know, it's (pause), like you blank it out by overeating . . . It's not necessarily the food, it-it depends on the circumstances, but it's definitely an addiction"*

They acknowledged their respective addictions to sweet foods (the wife nibbled her way through the sugar cubes on the tea-tray during the first interview), so they had opted for a Roux-en-Y gastric bypass procedure because that can lead to post-operative 'dumping' when sugar is consumed. 'Dumping' happens when the body cannot adequately process the sugar content, leading to very unpleasant side effects including shaking, vomiting, pain and diarrhoea. However, they seemed to have little understanding of nutrition, despite the many dietician visits, and while they talked about how they were going to begin 'healthy eating', there was evidence that they planned to replace their unhealthy pre-operative diet with a similar, but smaller, post-operative diet:

"We'll be getting a McDonalds kids meal between us"

The couple planned to 'swap' their mutual support for inappropriate eating behaviours to mutual support for taking exercise, when they had shed sufficient weight to become more mobile.

> *"But we're hoping that, once we've started losing weight, we'll probably join a gym . . . we'll start doing exercises together . . . so that'll probably replace the, the erm, going out for meals"*

However, there was no evidence that either partner had taken exercise in the past and an examination of the language used demonstrates a lack of commitment. The comment begins with the term *"hoping",* which implies a desire to exercise rather than an active decision, and this desire is contingent upon specific circumstances in the future *"once we've started losing weight"*, which negates the need to act in the present. The comment then goes on to mitigate the actions of joining a gym and replacing eating out with exercise with the adverb *"probably"*, which when taken as a whole, suggests that the participants are reporting what they think they should do rather than what they intend to do.

Applying the theory of planned behaviour (Ajzen, 1991) to the behavioural intention of reducing sugar intake to improve diet and beginning exercise, it seems likely that post-operative significant 'dumping' would be required for dietary change, alongside peer-support for the take-up of exercise, as shown in Figure 4.5.

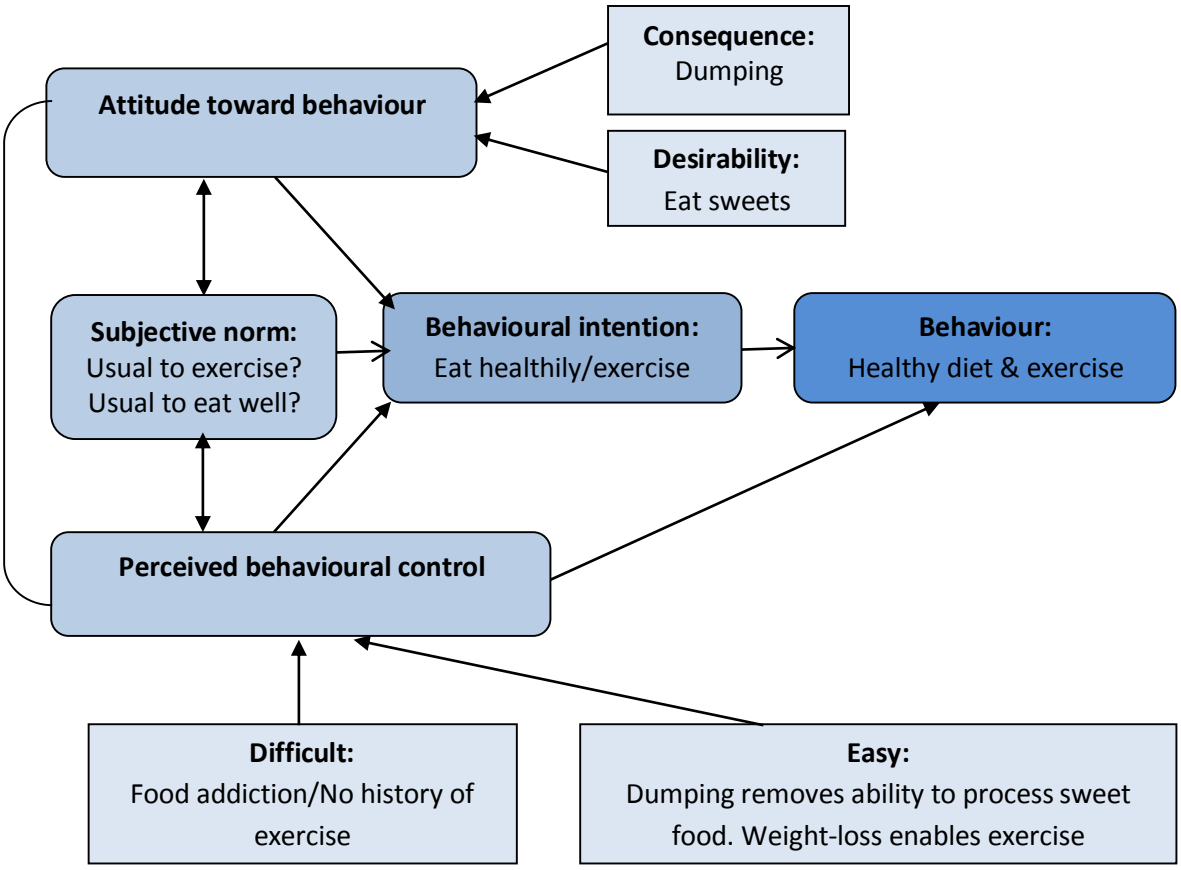


Figure 4.5: Theory of Planned Behaviour model applied to dietary and exercise change

Expectations for surgery

As with findings of previous research (Price et al., 2013), weight-loss expectations for surgical outcomes were perhaps unrealistic for this couple, with the wife expecting to reduce to 9 dress sizes smaller within 2 years, which would be 2 dress sizes smaller than her size when she was an adolescent. They also both had high expectations in relation to social outcomes, with a plan to start married life anew:

> *"We'll renew our (marriage) vows when we're all thin . . . and we are going to have the wedding that we didn't have"*
>
> *"It will be (pause), a courtship process . . . because we will be new people"*

This implies that they will both be different people, rather than the same people but thinner, and this has led to the fear of the unknown for the wife:

> *"I remember my doctor once saying to me that maybe deep down I'm frightened to lose the weight 'cos I will be a different person and I'm in my comfort zone the way I am . . . so, it's a fear of the unknown. I'm frightened of the future me"*

This was echoed by the husband who also articulated his fears about loss of identity following significant weight-loss:

> *"Because it's such, it's such (pause), a major (pause), life change you know? I would put it on a par with gender reassignment . . . because we are going to be completely different people"*

These fears about loss of identity could hinder the post-surgical weight loss, and are possibly borne out of concerns relating to having to give up on the well-established strategy of coping with emotions by eating, and abandoning comfort eating without a replacement strategy. However, the couple had arrived at a point in their lives where they felt they no longer had a choice, so they were going ahead with surgery despite the fears:

M *"It's very scary, but, you know, it's getting to a place in your head where (long pause), it's do or die"*

F *"It gets to a stage where you haven't got a choice"*

M: *"You know, and the depression and (pause), the suicide, suicidal tendencies and everything else it's (pause), you know, now I am a big person"*

The wife was also afraid that the slimmer husband would reject her in favour of another woman, because he would have more options open to him. This was a manifestation of her low self-esteem and feelings of worthlessness, something that was reinforced in the family relationships as illustrated by the following comment made by her mother on meeting the husband for the first time:

> *"He's really handsome; if he wasn't so fat you'd never have a chance with him"*

Moreover, they were experiencing sexual difficulties due physical limitations associated with obesity along with the husband being unable to maintain an erection because of low levels of testosterone, so he was avoiding physical contact of any kind:

> *"I'm terrified . . . oh sh*t I'm gonna have to perform, can I perform, I don't know if I can perform . . . well that's it, that's the mind set I'm in"*

Although the wife understands that the lack of sexual contact from her husband is due to physical conditions rather than a lack of attraction, emotionally she feels very vulnerable to rejection, and is afraid this is what will happen following weight-loss.

One-year later . . .

The second interview was conducted almost a year later, and both participants looked very different, having lost a significant amount of weight. The post-surgical weight-loss had plateaued and they had both resumed taking Orlistat in an attempt to promote further weight-loss. They were living apart because the husband was at a live-in facility for people with gambling addictions while the wife lived at home. The husband had undergone psychological therapy as part of his treatment, and now described his marriage as a 'co-dependent relationship'. They were clearly very unhappy from the start.

Post-surgical eating behaviours

The wife had lost around 5 stones in weight and the husband 10 stones, but they were very unhappy with the outcome because they had both stopped losing weight after about 5-6 months, and remained clinically obese. Where the couple had previously been united in their obsession with food and eating, they were now united in their fury about the 'failure' of the weight-loss surgery. Neither suffered from post-surgical 'dumping' so had resumed their previous eating behaviours, and could repeatedly give examples of continued inappropriate eating behaviours:

> *"I can quite easily manage 10 packs of crisps, I've not tried 10, I know I can manage four or five and still feel that I could eat more"*

They did not appear to take responsibility for their own part in the slowing down of the weight-loss process, nor did they recognise that their eating behaviours could be considered abnormal, with most people stopping eating when they are physically full, irrespective of left-over food:

> *"I don't get any adverse effects at all, other than I feel full, and when I feel full I stop eating, you know, but if I've got half a Big Mac left, or a mouth full of a Big Mac left, I'll eat that 10 minutes later and I'll be fine"*

The choice of a 'Big Mac' to illustrate the point clearly demonstrates that the pre-surgical expectations of a healthy diet combined with exercise had not materialised. Moreover, the participants were so insular in their lifestyle that they seemed unaware that their eating habits could be considered unnatural in the wider context of society:

> *"I don't dump. I once tried to make myself dump by eating 4 chocolate bars, one after the other, and it had no effect whatsoever"*

A re-examination of the model of post-surgical diet and exercise based on the theory of planned behaviour (Ajzen, 1991), shown previously in Figure 4.5, would suggest that the negative consequence of 'dumping' did not occur, so the desirability of consuming the unhealthy food became the dominant driver of the attitude toward behaviour change. The consequence of a slow-down in weight-loss associated with eating inappropriately is insufficient to promote change because it is their subjective norm. In addition, there has been no mention of exercise so taking exercise has not become a subjective norm, while eating large quantities unhealthy food remains a subjective norm, making the planned behaviour of replacing a joint addiction to junk food with regular exercise unlikely. This renders the perception of being able to control their consumption of unhealthy food as being beyond their capacity, and the behavioural intention to eat healthy food and take regular exercise has disappeared from their discourse. This has been replaced by a justification to continue with the pre-surgical diet and absence of exercise, and is illustrated in Figure 4.6.

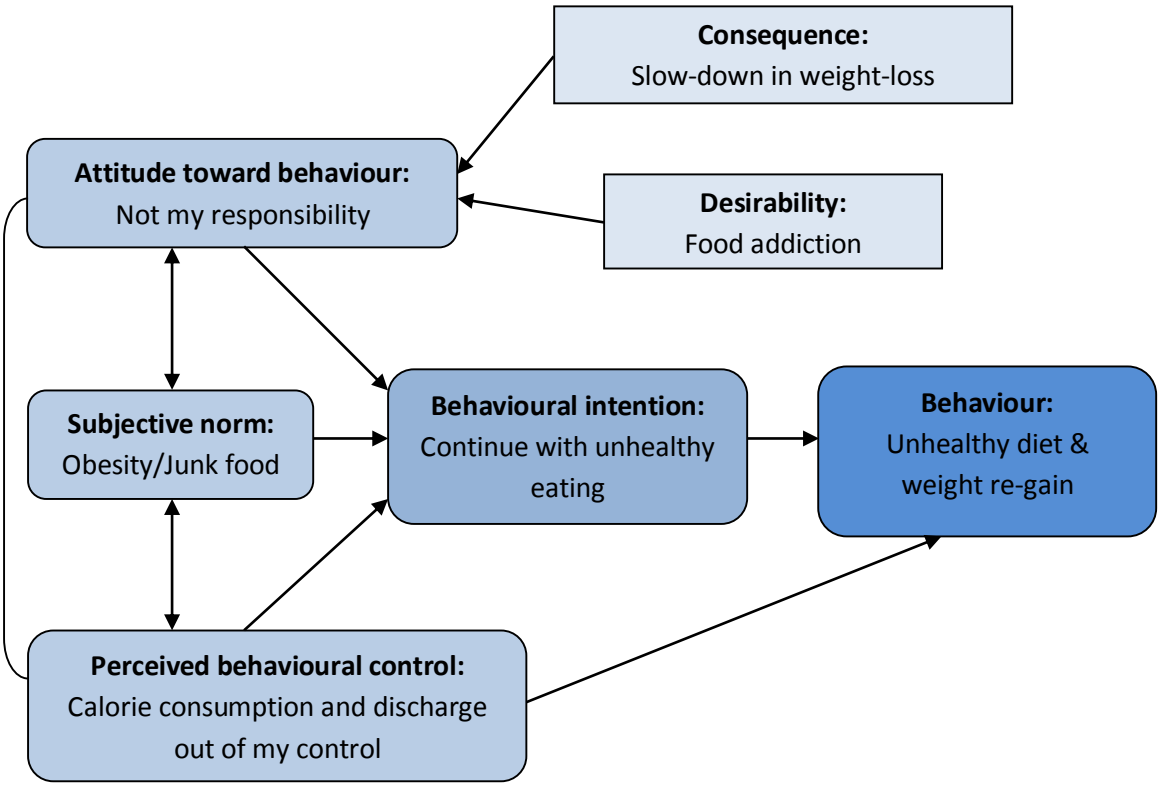


Figure 4.6: Theory of Planned Behaviour model applied to post-surgical dietary habits

The couple did not take responsibility for these choices, and instead blamed external factors, with the lack of 'dumping' being the focus, along with claims that healthy food could not be tolerated:

> *"I can eat tubs of Ben and Jerry's (ice cream) like, you know, just pure sugar with absolutely no reaction to it, and the other main problem is that I throw up what you'd call good stuff"*

They blamed the inadequacies of the surgical procedure for the slowdown in weight-loss and focussed almost entirely on not being informed that some patients do not suffer from post-surgical 'dumping', with the husband being so disappointed that he suggested he would

have rather died on the operating table than face the disappointment of only losing 10 stones:

> *"Rather than 'everything's wonderful just sign here', it's like, 'this worked for 2/3 but you need to be aware for 1/3 it might not' . . . the only risk they explain is that you can die on the table . . . that almost wouldn't have been as bad as, you know, because you wouldn't have known anything about it"*

This clearly illustrates the disproportionate disappointment felt, which could be linked to unrealistic expectations. Upon further questioning, they did acknowledge that they were slipping back into their old ways and that the poor diet was contributing to the problem, but felt unable to act differently:

> *"You know that's one of the reasons why I'm not on target, because I'm eating the sh*t still"*

> *"Eating is still the only pleasure I get"*

> *"I got that packet of crisps then you stick it in and you think, oh this is nice . . . chocolate's nice you know so . . . the pleasure's still there but it's because it's nice, whereas previously it's as much as you can get in, and that was a pleasure . . . that was a way of blocking off . . . now it's like you're slipping back into that"*

The return to pre-surgical unhelpful eating behaviours could be attributed to the surgical process only working on the physical aspect of obesity, with the psychological reasons why this couple overeat left unaddressed.

Starting a new life together

At the previous interview, the couple had plans to start a new life together when they had shed the weight, but this had not materialised and they reported that *"it's turned out quite the opposite really".* The husband blamed the relationship difficulties on the disappointing weight-loss, but the wife recognised that this blame was perhaps unjust:

> "*I think even if we had reached target weight we'd still have the problems we've got now. I don't think the problems we've got now are to do with the operation really"*

As the interview progressed, there was some acknowledgement that their expectations about the impact of the surgery on their relationship had been unrealistic, so perhaps disappointment was inevitable:

> *"I'm happy I've lost the weight and it wasn't, the miracle we were hoping . . . Unreasonable that it would be"*

The renewal of the wedding vows, complete with photographs, was unlikely to take place because the couple were both still very unhappy with their appearance, despite the weight-loss; with the husband reporting that *"I still see myself as fat and horrible"* and the wife saying she felt the same.

They had previously struggled to identify any joint activities that were not food-based, which seemed to be the basis of the relationship, and this had not changed apart from a reduction in pleasure:

> *"Well we went for a meal the other night and sat there and didn't talk"*

The couple had previously been bound together by an unhealthy addiction to using food as a coping mechanism, and this mechanism had been sabotaged by the obesity surgery, leaving them struggling to find common interests with *"We sit in the living room together"* being the only joint 'activity' they could identify apart from eating. This prompted the husband to call for change, but he could not articulate what form the change would take:

> *"We definitely need to put things in place that we can do together that are healthy and constructive"*

Intimacy

Intimacy was an ongoing problem in the relationship, which they hoped would be resolved by the surgery. However, the wife was very disappointed with the lack of intimacy, which had worsened rather than improved, with the husband choosing to spend time with his mother rather than his wife:

> *"He's a colder person towards me . . . he wants to divide his time by me and his mum, to me that isn't natural . . . he thinks it's perfectly natural and he can't see why I'm upset"*

For his part, the husband claimed he wanted an 'authentic' relationship with his wife and showed some understanding of the unhelpful dynamics within the relationship:

> *"And part of that is . . . this co-dependent relationship or whatever, you desperately want me to throw my arms around you and tell you everything's gonna be alright and erm, by doing that, in your head will make it alright, but you know it, it doesn't and it won't you know, and it's, it's me trying to not fall into how we were before, by pretending . . . and not being genuine"*

The discussion around intimacy revealed the dynamics of power in the relationship, along with adoption of parent-adult-child mental states. The couple acknowledged that their marriage was based on a parent-child relationship, but the husband now wanted and adult-adult relationship with his wife, but the wife clearly states *"I think I'm more of a child role to be honest"*, leading to a mis-match in communication.

The couple recognised that their difficulties with intimacy were as much psychological as physical, and resolved to discuss the matter further. The wife called the following week to thank me for my time, and said that following their interview they had

talked honestly with each other and had been physically intimate for the first time since surgery.

The hopes for the relationship

The couple retained the hope that their relationship would be good in the future, but the barriers identified were no longer weight-related, they were psychological. It would seem that the impact on their relationship of the obesity surgery was to reveal the psychological issues that were hidden by the comfort eating coping strategy. The husband was receiving psychological therapy and as a result, was recognising the difficulties within the relationship, including how they enabled each other in unhelpful behaviours:

> *"For me, going through the programme, it's grounded erm, me a lot and given me very real beliefs and expectations erm, you know, whereas you're (wife) always very much a fantasist . . . and I'm certainly a lot more of a hindrance than a help a lot of the time . . . the thing that I've learnt to do I need to take responsibility for me, and to know if I'm not happy, comfortable with myself"*

The husband also acknowledged that they had blamed obesity for their unhappiness, rather than the underlying psychological habits that had caused the obesity:

> *"(wife) needs to do what she needs to do erm, so that we are happy with ourselves and then we can be happy as, as a couple whereas as I say this time last year it was very easy to put it onto something else (obesity)"*

The couple also revealed that they loved each other, but were no longer 'in love' with each other. They hoped that this would change, but again had no strategy to make it happen. Their previous fears about changing into different people following surgery were unfounded. However, the husband has discovered a greater understanding of himself and his unhealthy behaviours through undergoing psychological therapy, and this had led to a change that has not been matched by his wife, which has put further pressure on the relationship. They discussed the current state of their relationship, and determined that it was not good and perhaps close to breaking point:

> *"The reality is it would be very easy for us both to give up on it altogether"*

But they held onto the prospect of everything being somehow resolved in the future:

> *"In the future, you know, when I'm sorted and T (wife)'s sorted, then our relationship can be sorted"*

By applying the same approach to repairing their marriage as they did to post-surgical changes, namely blind optimism but no strategy, there is a danger that they will be equally disappointed with the outcome.

Psychological input

The interview went through several emotional phases; beginning with joint anger at the 'failure' of the obesity surgery, which brought them together against a common foe, through distress at the disappointing state of their relationship, which set them apart and each perceived the other as the foe, concluding with a calm acknowledgement of their own foibles and a desire to work together to resolve their difficulties. The final stage was perhaps the most helpful, with a re-evaluation of situation and an acknowledgement that their disappointment had more to do with choosing to pay attention to information that aligned with their expectations, than a 'failure' of the surgery. The couple went on to identify that psychological input would be beneficial:

> *"I know they do say that it's not a miracle but you hope that it will be . . . so there is (pause) further stuff that can be done you know, studies like this to help people realise what needs to be done . . . running themes like this session"*

> *"I think, you know, weight loss on its own will not solve the problems . . . I think that's a natural conclusion and part of what people need to be been told"*

The content of the interview became very sensitive and emotionally charged, with both parties clearly upset. The researcher was ethically bound to steer the participants through the process rather than leaving them distressed, with the wife exalting *"This is counselling, this is what we need!"* The interview progressed to the end, and was terminated when both parties had recovered emotionally. The couple was given the choice of returning at a later date to continue with the research, or terminate the process. Both continued.

Another year later

The couple had managed to maintain some weight-loss, with the husband shedding a further 2 stone and the wife a further 15lbs in the intervening year, but this included resuming use of Orlistat. They were still very disappointed at the weight-loss and blamed this on the absence of post-surgical 'dumping' rather that their own behaviours, so had maintained an external attribution to weight-loss:

> *"Again the main problem for me is I never (pause) get any negative feelings at all with like stuff that's bad for you so you know, crisps chocolate ice cream you, you, never get the sensation that you're full or what have you just melts in there quite nicely and you know, you knew that was your problem before you had the op and it's no surprise that a 24 year habit you know has come back afterwards"*

However, it was clear that they had reverted to their pre-surgical cognitive dissonance around eating, where they talk about intentions to eat sensibly while doing the opposite, such as eating a large family sized lasagne between them, followed by a 500ml tub of ice-cream each:

> *"My intention was to freeze the other half you know, to put it into individual portions erm, containers, and freeze them so you could just eat them all individually, but you know, you never really . . . the intentions are always there, that's what I intended to do, I was gonna let it cool down a bit . . . I was fancying, I said to (husband) 'do you want another portion' and he said 'yes' so you know, we both had extra . . . then we got a Ben and Jerry's each . . . They were 500ml"*

When it was suggested to the couple that they were perhaps sabotaging the likelihood that they would eat healthily or consume smaller portions by purchasing the family-sized ready meals and multi-packs of crisps and chocolate bars, they cited cost as a

rationale, and the possibility of replacing these purchases with healthier fresh food options was not part of their discourse:

> *"I will buy a 6 pack rather than an individual pack just due to finance . . . you'll pay 45p for one pack and you get 6 for 99p"*

This thought process, when applied again to the theory of planned behaviour (Ajzen, 1991), as shown previously in Figures 4.5 and 4.6, demonstrates that the couple's attitude towards diet facilitates the continued consumption of large quantities of inappropriate food. The negative consequence of poor weight-loss is ameliorated by blaming the limitations of the surgery, so the desirability of consuming the junk food became the dominant driver of the attitude toward behaviour change, reinforcing feelings of helplessness associated with dietary control. The couple also eat in isolation and recognise that this enables the inappropriate quantities of food to be eaten without associated social stigma:

> *"Because there's no-one else there to eat all 6, whereas if there's someone else there . . . it puts a little bit of restraint on"*

Therefore, eating large quantities unhealthy food remains a subjective norm, making the continued consumption of junk food likely. This leads to their perception that consumption of unhealthy food is beyond their control, and the behavioural intention to purchase healthy food is not a part of their discourse. This has been replaced by a justification to continue with the pre-surgical diet and without accepting responsibility for subsequent weight re-gain. This is illustrated in Figure 4.7.

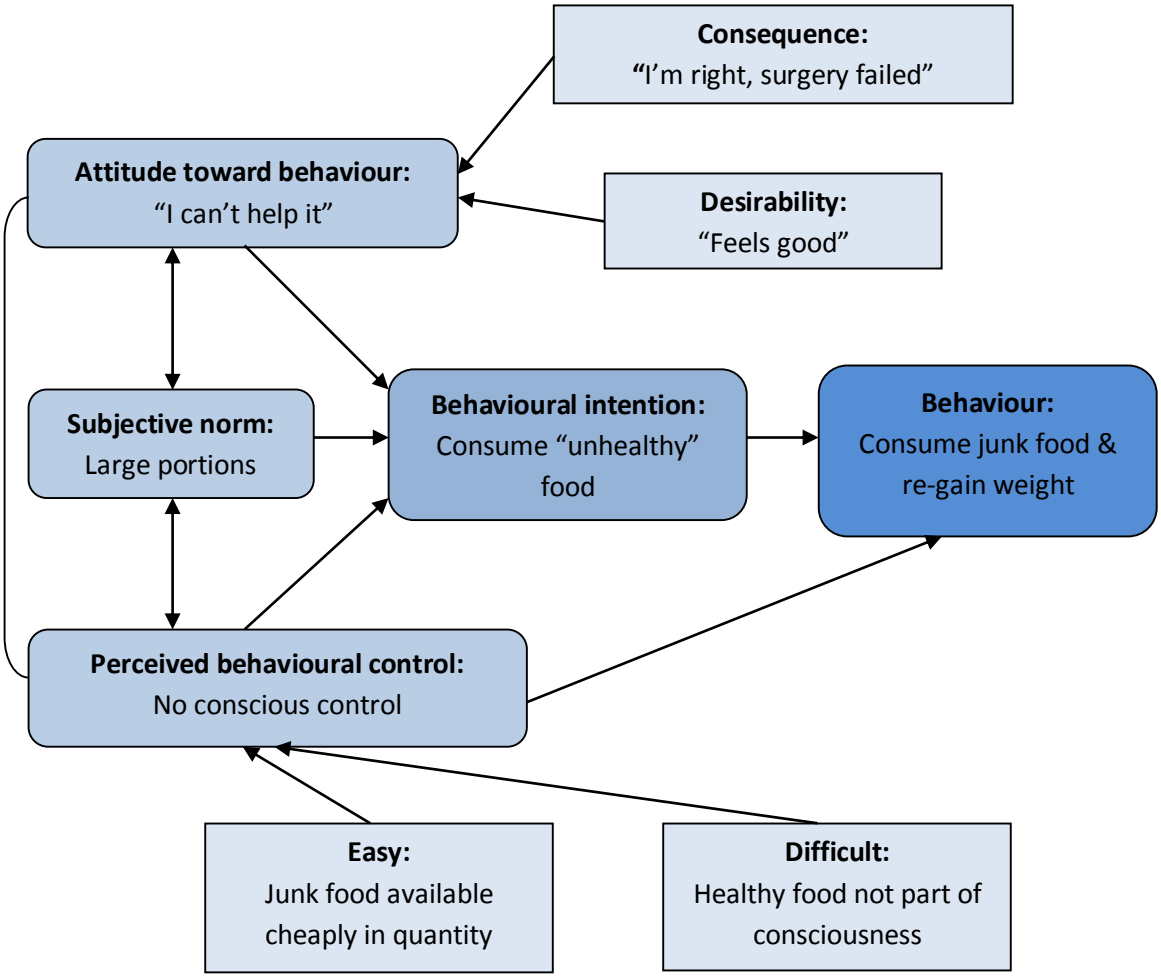


Figure 4.7: Theory of Planned Behaviour model applied to post-surgical junk food consumption

The wife recognised that her eating was out of control and had again attempted to access psychological support through an eating disorders service, but this had proved unsuccessful. However, both the husband and the wife reported self-induced vomiting to cope with the feelings of nausea following a binge, suggesting some form of disordered eating:

> *"I used to have to make myself sick, you know, and in the end, erm (pause), occasionally you know, you wouldn't get the choice"*

> *"If it's gonna make me sick, I'll go and throw up . . . And I'll make myself throw up now . . . I'd rather get it out the way, right 'fingers down my throat', right"*

Another aspect of the wife's behaviour that pointed to disordered eating was that she understood on a cognitive level that her eating behaviours were often irrational, but the feelings of deprivation that she ameliorated with 'junk food' were so overwhelming that she could not resist eating, even when the banned substance was not something she really enjoyed eating:

> *"Yeah . . . it was one of those, where it was nice enough, but you know it's not one (ice-cream) I'd go out of my way to have . . . but because (husband) was having one I thought 'yeah I'll get one' but I don't really fancy any of them, but yeah, I'll have that one because it's ok, you know, I couldn't say 'no actually I don't want one'"*

The language used to describe trying to avoid eating junk food, or 'stuff', echoed that used by addicts trying to avoid the substance being misused:

> *"I can keep myself busy at home . . . and I don't have access to the stuff unless you know, I've been shopping but I try not to buy goodie stuff (sweets and chocolate) when I go shopping, I do try my best don't always succeed, but I do try my best"*

The wife felt that her eating was completely out of control so she wanted somebody else to take responsibility for her food intake to prevent her from having access to the 'bad food'.

The relationship

The couple are still living apart, with the husband choosing to remain for a longer period at the live-in facility in Birmingham to work on his addictions. However, they recognise that things would be more difficult if they lived together, particularly in relation to food and their respective eating habits:

> *"He's more likely to encourage me to eat the ice-cream, but I'm more likely to encourage him to eat out for meals more"*

Indeed, their personal relationships with food seemed to be stronger than their relationship with each other, and whereas before it brought them together, now it was becoming a potential barrier between them, with each blaming the other for their self-destructive behaviours. The wife confessed an inability to resist eating certain foods if they were available in the house, and she blamed the husband for buying them for himself, so the husband was becoming increasingly frustrated with this:

> *"The reality is you've eaten lots of bad stuff in the 43 weeks that I've not been there, so who's bought it then? . . . That's, the distortion in your head, you have been good and you're not doing this, that and the other, but the reality is that you are"*

He clearly felt constrained and controlled by her eating compulsions:

> *"Yeah but, it's like, I go to the cupboard and there's nothing there that I can eat, and I can't buy anything in that I can eat, because she'll eat it . . . it's just ridiculous"*

She suggested that the problem could be resolved by the husband having a locked food cupboard that she could not access, and he could eat the food in secret. However, this could put another barrier between them in a marriage that already suffered from secrecy associated with the husbands gambling addiction. The husband clearly did not want this solution, and blamed the wife for not addressing her difficulty with lack of restraint:

> *"You know, it shouldn't be that I have to adapt to your problem (pause) do you know what I mean? You should be able to resolve your problem (pause) and that's, that's where you need to get to, I'm not trying to be harsh or anything . . . It's unrealistic, whatever you put in place it's just like, papering over the cracks really"*

The wife's inability in resist junk food was long-standing, as was her perception that other people deliberately taunted her with food. The only affection demonstrated between the couple was when she was describing exactly the same pattern of behaviour with her ex-husband, perhaps because the blame was directed elsewhere:

> *"My first husband erm, he was quite cruel really, erm, and he knew you know, that I wanted to lose weight, and he would deliberately go out and buy himself 2 Big Macs, bring them home and sit and eat them in front of me, because I should have the will power to not want anything"*

This attitude of blame extended across all domains of the relationship as food was the dominant force within the relationship. The husband had previously bought the wife sweet treats as a way of showing his affection for her, but it had become a poisoned chalice:

> *"I feel unsupported if he buys it (sweet treats) . . . Knowing that I've got this problem"*

Lack of intimacy and affection was clearly still an issue within the relationship, but this had also become entwined with the emotions around disordered eating, with implicit blame for an inability to restrain from eating inappropriate foods being associated with lack of intimacy from the husband:

> *"(Husband needs) to tell me that he loves me, and being affectionate, because that again, not feeling loved is one of my underlying problems . . . because I eat when I'm not happy . . . So if I was happy I don't feel the need to eat"*

The area where the couple are still united is in their disappointment at the 'failure' of the surgery, and they claimed that the disappointment led them to eat more inappropriate food, thus confounding the problem:

> *"I've got this flow of blaming them (surgeons) . . . I'm ok to stay there . . . But you know, I don't like it and unfortunately that just makes me want to eat more sh*t stuff"*

Their disappointment is in part due to their expectations about obesity surgery, because they thought that it would be a life changing process where they would emerge as different people, with the husband suggesting it was on a par with gender reassignment surgery. He resumed the analogy to emphasis his disappointment with a *"job half done"*:

> *"It should have been that much of a change you know, if it had done what it said on the tin, it would have been . . . I'm a partial lady-boy"*

This has led to plans for further obesity surgery in the form of a revision or a Duodenal Switch. However, this strategy is emotion rather than logic based and could be contributing to the slowdown of the weight-loss process, with the ongoing weight-loss being inversely proportional to the likelihood of qualifying for further surgery:

> *"I've had some thoughts too . . . 'why should I bother' (pause) like, trying to eat good stuff that makes me feel sh*t and go and exercise because by the time I get to see the appointment all they're looking at is, all they've got is what weight you were the last appointment so if they see that you've lost 2 stone erm you know in between times"*

Indeed, the wife was even considering deliberately gaining weight to qualify for further surgery:

> *"Yeah and I think mine's (BMI) around about 40, but I'm sure I could very easily put weight on"*

Psychological input

The couple agreed that one of the reasons why surgery was only partially successful was that their behaviour around food had not really changed. It was modified by not being able to eat very much at the beginning, and by the husband eating at a much slower pace, but the feelings around food and the use of food as a coping mechanism had not changed significantly. The husband was receiving ongoing psychological support for gambling at the addiction facility and this had also helped him with his eating behaviours, but the wife had not received specific psychological support for her eating behaviours and concluded that:

> *"What I think they need is psychological input before you have the operation"*

Indeed, she suggested that this could potentially negate the need for surgery altogether:

> *"Whereas if they had that service and it was long term help for people with eating problems (pause) then it might even save the need from them having to pay for the operations, if they can get to the root of the problems (pause) you know they might even save themselves a few thousand pounds on having the operations"*

She was desperate for a psychological intervention and was prepared to try whatever was available:

> *"I'm undergoing counselling, but not therapy, and I think really I do need a more dynamic approach . . . I was at the surgery this morning erm, and they've got this new computer based CBT . . . she's recommended me for that, so I should get an appointment through quite soon for that . . . So you know, she's recommended that for me so I'll try anything"*

The final point of contact

The couple were contacted a year later to schedule a final interview, but it did not take place. A lengthy telephone conversation with the wife revealed that the husband had not returned to the marital home, and had instead begun a new life in the Midlands. They planned to divorce as soon as they could afford it.

The couple had remained friends, but had come to realise that when they met and 'fell in love', they had simply recognised another soul with a similar compulsion around food, someone who understood. They hoped that the surgery would give them a 'normal' life together, but instead it removed the one thing that held them together.

They had decided to take their battle with obesity in different directions; the husband had recently undergone a second bariatric operation to try to achieve the full 'gender reassignment' that he craved, while the wife continued with counselling.

The wife had come to the conclusion that she was glad she had the surgery because her mobility was greatly improved and she generally 'felt better about herself'. She was trying new things that she would have never considered before; aqua aerobics and internet dating, and had started volunteering in a women's centre. She had resumed taking anti-depressants, but stated that her mood was not as low as when she had taken them in the past.

Discussion

This study was unique in identifying the dynamics within personal relationships that can help or hinder the post-surgical weight-loss process over a period from pre-surgery to three years post-surgery. Both participants had long-term chronic obesity with associated health problems (poor mobility, sleep apnoea, diabetes, and hypertension) and a long history of weight-cycling, and had experienced childhood obesity for which parental abuse was cited as the cause; sexual abuse in the case of the husband and emotional abuse in the case of the wife. These are forms of childhood abuse that are over-represented in obesity surgery samples (Sansone et al., 2008; Liebenberg, & Papaikonomou, 2010; Danese, & Tan, 2014) making the participants representative of typical obesity candidates. Weight-gain following childhood abuse if often the result of self-soothing with food, an activity that becomes the default behaviour pattern, and the associated weight-gain can be perceived as a punishment to the parent (look what you have done to me). This behaviour was entrenched in the couple in the current study, so when the obesity surgery failed to deliver the desired outcome, they resumed their childhood behaviour pattern and actively considered deliberately gaining weight to punish the medical team (parent substitutes), thus sabotaging the weight-loss process.

Food was found to be the coping method used to manage the long-term effects of the childhood abuse and a joint dependence on food was the lynchpin in the development and maintenance of the participant's personal relationship. The couple frequently binge ate together (e.g. 2 litres of ice-cream each in a single sitting), an activity that they kept secret from those outside of the relationship. This was an integral part of the intimacy in the relationship and functioned to replace physical intimacy, which the husband found difficult to engage with. The couple lived separately following surgery, but when they were together

eating was problematic and caused issues within the relationship that were experienced as a loss of intimacy, and the joint bingeing continued to some degree because this was their common ground, but it compromised the weight-loss process. This has clear implications for clinical practice, with recommendations to include interventions to support familial changes in eating behaviours along with identifying the role played by food in the maintenance of personal relationships.

A history of child abuse has been found to be strongly associated with food addiction in women (Mason, Flint, Field, Austin, & Rich-Edwards, 2013), and the couple in the current case study support this finding as they experienced their emotional dependence on food as a physical and psychological addiction to using food as a mood regulator, and described food using analogies similar to those used by substance misuse addicts. They were desperate to cease this addiction, but were also fearful of the consequences because they had no alternative coping mechanisms or joint activities. Obesity surgery was perceived as the solution to ceasing the food addiction, with the expected post-surgical negative physical effects from eating junk food being cited as a deterrent; in much the same way as the drug disulfiram is used as a deterrent when treating alcoholism (Soghoian, 2013). By undertaking obesity surgery together, participants were trying to increase the probability that they would succeed in beating the food addiction, in a similar way to couples who pledge to give up smoking together. However, the expected post-surgical nausea when consuming processed foods high in sugar did not occur, and weight-loss was compromised by continued consumption of a high volume of calorie-dense processed food. The dynamics of the relationship facilitated this continued consumption, in the way that substance misuse is facilitated by living in an environment where this is the social norm. This suggests that

psychological interventions similar to those used to treat other addictions need to be integrated with changes to social norms to optimise the success of obesity surgery.

The current case study was designed to discover the dynamics within personal relationships that help or hinder the success of obesity surgery rather than provide an intervention to improve surgical outcomes, so although the Theory of Planned Behaviour (TPB; Ajzen, 1991) was applied to help understand post-surgical diet and exercise behaviour changes, no attempt was made at an intervention using this model. In the pre-surgical phase the couple reported a positive attitude to dietary and physical exercise changes which combined with strong perceived behavioural control, and led to positive intentions for behaviour change. However, the perceived behavioural control was centred on the external factor of 'dumping' following consumption of food high in fat and sugar, and when this dis not occur, poor perceived behaviour control was evident along with a negative attitude to change, so the initial behavioural intention did not translate into a change in behaviour. Diet then became the focus of the behaviour change, and exercise was not given further consideration. When examining post-surgical junk food consumption, there was an attitude of the immediate enjoyment of consuming the food being much more important than concerns about long-term associated weigh-gain, supporting Dunn et al.'s (2011) previous findings with a traditional obesity sample. This attitude was combined with extremely low perceived behavioural control and a subjective norm of secretly consuming this food together, so it became evident that the conditions necessary for long-term behaviour change were not supported in the relationship, and that dietary change had not been addressed by the surgical intervention.

In terms of exercise, the couple were enthusiastic about taking up physical activity at the critical point just prior to surgery, providing further support for Livhits et al., (2010), but this intention did not translate to action, perhaps because of unrealistic expectations and goals, supporting the findings of Stroops and Alexander (2011), and this failure to change was replicated with dietary behaviours. The couple adopted a passive attitude towards the required diet and exercise behaviour changes so failed to take responsibility for their actions, they believed that they had little control over their behaviours and the subjective norm remained unchanged, a factor that Hunt and Gross (2009) identified as crucial for behaviour change in an obesity surgery population alongside the well-established perceived behavioural control. Hence, self-sabotaging pre-surgical diet and exercise patterns continued and weight-loss was compromised.

Dissemination

The findings from the qualitative studies have been widely disseminated. Issues around data collection and analysis were presented in poster format at the British Psychological Society Annual Conference in Dublin, April 2008 and orally at the Postgraduate Researchers in Science Medicine Conference in Liverpool, September 2008.

The preliminary findings were orally presented at the PSYPAG Annual Conference in Manchester, July2008, and in poster format at the Institute for Health Research (IHR) Obesity and Weight management Seminar Day, Liverpool, December 2008, where it won 'runner-up' prize. They were then delivered as an oral presentation at the Liverpool John Moores University Faculty Research Seminar, May 2008.

Aspects of further analysis were presented in poster format at the BPS Annual Conference, Brighton, 3rd April 2009, in both oral and poster format at the Salford University Postgraduate Annual Research Conference, May 2009, where it won the research prize, and in oral format at the Liverpool John Moores University Faculty of Science Postgraduate Research Day, May 2009, and at the BPS Division of Health Psychology Annual Conference in Birmingham, September 2009.

STUDY 8

Obesity surgery quantitative pilot study

Obesity surgery candidates in a non-clinical setting are a hard to reach demographic group. Therefore, it was planned that a large scale quantitative survey would be carried out via an online forum for obesity surgery candidates because of the large number of people registered and because it was not affiliated with the NHS or any private clinical practice. However, this is method of data collection makes the participants completely anonymous with no direct contact between the researcher and the participant, so it was of vital importance that the measures were appropriate for a potentially vulnerable participant cohort.

The research aim of this pilot study was to test the feasibility of a battery of quantitative SWB measures for use with an obesity surgery cohort. The subsequent study would employ on-line data collection, so any measures that could hinder data collection due to incomprehension or insensitivity would need to be amended or eliminated. These measures combined those used previously in part 1 of this thesis, along with additional measures and appropriate demographic questions that emerged from the findings of the qualitative studies.

Method

Participants

The 9 participants who took part in the qualitative study took part in this quantitative pilot study, as detailed previously.

Design

Although a quantitative methodology was used, an ideographic approach was taken with each participant being treated individually to test for the suitability of the measures.

Materialss

The measures comprised of some of those used in the previous studies; namely the *Life Orientation Test - Revised* (Carver & Scheier, 1985), the *Satisfaction with Life Scale* (Diener et al., 1985), *The Five Factor Model* (Costa & McCrae, 1985) and *Self-esteem* (Rosenberg, 1965). The *Physical Appearance State and Trait Anxiety Scale* (Reed et al., 1991) was excluded because of concerns that the items may exacerbate physical appearance anxiety in a very obese cohort.

In addition, *Self-efficacy* (Schwarzer, & Jerusalem, 1995), *Zung Depression Scale* (Zung, 1965), and *Eating Disorder Examination-Questionnaire* (EDE-Q 6.0; Fairburn, & Beglin, 2008) were assessed as detailed below.

Generalized Self-Efficacy Scale (Schwarzer, & Jerusalem, 1995).

This measure was designed to test perceived self-efficacy, reflecting an optimistic self-belief that one can perform novel or difficult tasks, or cope with adversity in various domains of human functioning. The self-efficacy measure is widely used and well established in research literature, with a high reliability in this study of: Cronbach's Alpha = 0.88. This is a 12-item measure with a 5-point Likert response format, ranging from 1 = Strongly Agree to 5 = Strongly Disagree. Scores can range from 12 (very low self-efficacy) to 60 (very high self-efficacy), and the mid-point of the scale is 36. Five-items are reverse-scored to prevent an automated response and higher values reflect higher self-efficacy

across the measure. Examples of items in this measure; 'If something looks too complicated I will not even bother to try it', and 'When I make plans I am certain I can make them work.' See appendix 4F for the full scale.

Zung Depression Scale (Zung, 1965)

This measure was designed to test for depressive symptoms in an obesity surgery cohort, to use as a proxy for mental health (see appendix 4G). The Zung Depression Scale was chosen because it is freely available and has sound psychometric properties (Carroll, Fielding & Blashki, 1973), with a high reliability in this study of: Cronbach's Alpha = 0.82. This is a 20-item measure with a 4-point Likert response format, ranging from 1 = A little of the time to 4 = Most of the time. Scores can range from 20 (very low frequency of depressive symptoms) to 80 (very high frequency of depressive symptoms) and the mid-point of the scale is 40, and most people with depression score between 50 and 69. Ten items are reverse-scored to prevent an automated response and higher values reflect higher symptoms of depression across the measure. In the item content respondents are asked to estimate the extent to which they have depressive symptoms, both psychological and physical. Examples of items include, 'I have crying spells or feel like it' and 'My heart beats faster than usual',

Eating Disorder Examination-Questionnaire (EDE-Q 6.0; Fairburn, & Beglin, 2008).

This revised version of the Eating Disorder Examination (EDE; Fairburn & Cooper, 1994) is a reliable self-report measure of eating disorders which has been validated for use with both community cohorts (Mond, Hay, Rodgers, Owen, & Beumont, 2004) and bariatric surgery cohorts (Kalarchian, Wilson, Brolin, & Bradley, 2000). It is appropriate for an

obesity surgery cohort because it is effective in assessing purging behaviours (Binford, Le Grande, & Jellar, 2005) and binge eating disorder (Reas, Grilo, & Masheb, 2006).

There are 28 items measuring 4 sub-scales; restraint, eating concern, shape concern and weight concern. The sub-scale 'restraint' was not included as this relates to anorexia nervosa so is irrelevant to the current study. The sub-scale 'eating concern' was made up of 6 open-ended items relating to eating concerns experienced over the previous 28 days. The minimum possible score was 0, indicating no concerns, and there was no maximum value, but the higher the value the greater the level of eating concern. Three items tapped into overeating and loss of control and 3 items tapped into purging behaviours (self-induced vomiting, laxative misuse and compulsive exercise). An example item is 'Over the past 28 days, on how many days have such episodes of overeating occurred (i.e. you have eaten an unusually large amount of food and have had a sense of loss of control at the same time)?'

The sub-scale 'shape concern' is a 3-item measure with a Likert response format ranging from 0 to 6. Individual item scores of 4 or above are considered clinical (Fairburn, & Beglin, 2008). Scores can range from 0 (no shape concern) to 18 (extremely high shape concern). An example item is 'On what proportion of the times that you have eaten have you felt guilty (felt that you've done wrong) because of its effect on your weight or shape?' The sub-scale 'weight concern' is a 7-item measure with a Likert response format ranging from 0 to 6. As with the previous sub-scale, individual item scores of 4 or above are considered clinical. Scores can range from 0 (no shape concern) to 42 (extremely high shape concern). An example item is 'How dissatisfied have you been with your shape?' (see appendix 4H).

In addition to the validated measures, a number of demographic questions were asked to gather a profile of the participants. These comprised age, gender, surgical procedure, time elapsed since operation, previous BMI, current BMI, heaviest weight and ideal weight.

Procedure

Participants were invited to complete the measures when they had finished their interview. They were told that it was to test for suitability for an online study. There was no time limit to complete the questionnaires and papers were scored immediately and participants were provided with verbal feedback. Participants were then asked for feedback on the process, including sensitivity of subject, ease of use and any omissions.

Ethical considerations

As with the previous studies, ethical approval was granted from the Research Ethics Committee at Liverpool John Moores University. It is considered ethical to trial a battery of measures with a small number of participants where they receive one to one feedback before it is posted online to anonymous users who may be vulnerable.

Results

Although the cohort was very small, they were representative of an obesity surgery cohort with heaviest weights recorded ranging from 236kg to 225.5kg (mean = 175.4kg) and ideal weights recorded ranging from 50.80kg to 107kg (mean = 77.52kg). The content of the measures was easily understood by the participants, and the descriptive statistics demonstrate normality and stability across the measures as shown in table 4.2 below:

Table 4.2: Descriptive statistics for the six self-report measures

Measure	Mean	(sd)	Range (actual)	Range (possible)	Skewness	Kurtosis
LOT	16.67	(4.80)	9-23	7-35	-0.58	-0.79
SWLS	13.67	(9.97)	5-29	5-35	0.67	-1.6
S/EST	31.11	(12.88)	12-46	12-60	-0.45	-1.43
S/EFF	32.78	(11.39)	18-48	10-50	-0.07	-1.79
ZUNG	47	(10.39)	31-62	20-80	-0.16	-1.02
O	34.78	(6.02)	23-41	5-45	-1.09	0.331
C	36.11	(5.71)	28-45	5-45	0.04	-0.88
E	30.33	(8.59)	17-43	5-45	-0.21	-0.84
A	37.67	(5.05)	30-45	5-45	-0.12	-1.36
N	31.44	(8.55)	20-45	5-45	0.33	-1.05

LOT = Life orientation test. SWLS = Satisfaction with life scale. S/EST = Self-esteem. S/EFF = Self-efficacy. ZUNG = Zung depression scale. O = Openness. C = Conscientiousness. E = Extraversion. A = Agreeableness. N = Neuroticism.

The small cohort demonstrated low optimism (mean = 16.67), low life satisfaction (mean = 13.67), low self-esteem (mean = 31.11) and moderate self-efficacy (mean = 32.78).

All five personality factors were nestled in the positive parameters of the scale, including neuroticism (mean = 31.44) which is usually in the negative parameters in a non-clinical sample. The mean score for depressive symptoms (47) was fairly high, and close to the parameter descriptor of depression (50 or more). On further examination of the scores for the Zung depression scale, it was clear that only 3 participants (33% of sample) were not depressed, a further 2 participants (22% of sample) scored 47, close to the threshold for depression (50), and 4 participants (44% of sample) scored 50 or above, so would have been classified as depressed.

Participant feedback

Participants reported no difficulty in completing the measures, but a number of participants had concerns about the Zung depression scale being included in the on-line study. They felt it was appropriate to be used in the pilot study because they received one to one feedback so could ask any questions that arose, but they felt that in an online setting, where feedback was not instantly available, the Zung depression scale could leave depressed participants feeling low because of the focus of the questions. They suggested that this measure could be replaced with a question on the use of anti-depressant medication, as a proxy for identifying prevalence of depression.

Participants also suggested changes to the demographic questions asked. They found it difficult to remember and record BMI, both previous and current, and suggested weight and height would be easier for participants to complete. They also had reservations about the value of recording their 'ideal weight', because that changed according to their current weight, and went lower when it seemed more achievable. They suggested that a question about satisfaction with post-surgical weight loss would be more appropriate. Following on

from this, the *Physical Appearance State and Trait Anxiety Scale* (PASTAS, Reed et al., 1991) was discussed and participants were of the opinion that it would be appropriate to be included in the battery of measures.

Participants suggested a number of items that could be added to the demographic questions because they felt them to be important. They identified health status and quality of life status as important outcome indicators for obesity surgery candidates. One participant also recommended the inclusion of a question about what she termed 'head hunger' because it was something that she would have liked to have been unaware of before she underwent surgery. 'Head hunger' was her term for hyperphagia, where an individual has an unrelenting drive to eat, even though there is no physical hunger and the result of eating could be severe pain, nausea or vomiting. A further demographic area that was suggested was personal relationships. It was felt that this was important for an obesity surgery cohort because the outcomes of surgery impact on those close to the patient and can result in changes to relationship status.

Discussion

The aims of the study in testing the feasibility of SWB measures for an anonymous on-line obesity surgery sample and identifying omissions and redundancies were met. In addition to identifying potential problems for the proposed on-line data collection method, the process of conducting a pilot study proved beneficial to participants who reported that taking part was enlightening and made them think more about the psychological impact of the surgery. However, this positive outcome would be unlikely to be replicated in the subsequent main study because participants would only have access to a research de-brief and contact details for further information, rather than one-to-one feedback of their scores on the measures. This raises questions about the limitations of an anonymous on-line study, but the hard to reach nature of the sample renders other forms of data collection unfeasible.

The general format of the measures was found to be suitable for an online study, but some potential issues were raised. A main finding relates to the overall consensus that the Zung depression scale (Zung, 1965) was inappropriate for an on-line obesity surgery sample because the questions were too intrusive and sensitive for use without individual feedback. Participants were shown items from the Beck Depression Inventory (Beck, Ward, & Mendelson, 1961) to consider as an alternative measure, but the response was the same as for the Zung depression scale (Zung, 1965). Participants were concerned that the items brought depressive symptoms into conscious awareness which could lead to rumination and low mood in a sample already prone to depression. Given the planned method of on-line data collection via the wlsinfo.org website, it was considered to be extremely likely those potential participants would participate while home alone and seeking on-line company from other wlsinfo.org members, and that this made them vulnerable to low mood and negative affect. Despite creating a clear limitation for a study based on a sample with an

expected comorbidity of depression, for ethical purposes it was agreed that measures of depression would be omitted from the larger on-line study. This has implications for other studies based on on-line samples of hard to reach populations where an alternative to a standard measure may be more appropriate.

As an aim of the study was to test the feasibility of the measures and depression scales were deemed inappropriate, an alternative method of assessing prevalence of depression was sought. Given that prescription of anti-depressant medication is the most common first-line treatment for depression (Valdivia, & Rossy, 2004), it was expected that participants with a comorbidity of depression who had sought treatment would have a history of taking anti-depressant medication. Because a measure of depression could not be included in the battery of measures to be used in the on-line study due to ethical concerns, an item on the use of anti-depressant medication would be included as a proxy for identifying prevalence of depression in this sample.

The Physical Appearance State and Trait Anxiety Scale (Reed et al., 1991) was not included in the pilot study due to concerns that it could raise anxiety in an extremely obese sample, but an open and frank discussion with participants revealed that while they were unhappy with their appearance, this was something that they had come to terms with, and it was an important factor in choosing surgery as their preferred obesity treatment. Moreover, participants reported that their body size was more accepted and less stigmatised in the context of the wlsinfo.org group because they were all obese, providing further support for the importance of cultural context in experience of obesity stigma and SWB (Bockerman et al., 2013). Hence, the omission of the Physical Appearance State and Trait Anxiety Scale (Reed et al., 1991) was deemed to be as a result of researcher bias in thinking that the

extremely obese would be anxious about their appearance rather than a valid ethical concern, so it was approved for use in the subsequent on-line study. This provides further support for the value of conducting a pilot study when working remotely with a clinical sample in a non-clinical setting.

Participants found correctly recalling BMI difficult but this was not because they were embarrassed about their BMI, rather it was because their weight was rapidly changing so they tended to focus on weight rather than BMI. BMI is a more objective indicator of susceptibility to obesity-related health issues than weight because it takes account of the height to weight ratio and the outcomes are standardized. Therefore, in the subsequent study the BMI questions would be replaced with self-reported current and pre-surgical weight, along with height, so the researcher could estimate participant BMI. There was a similar issue with the question about ideal weight which changed according the current weight, so this was replaced with a question about satisfaction with post-surgical weight-loss, which would tap into a similar construct but would be more appropriate for an obesity surgery cohort spread across different post-surgical time scales.

The value of conducting a pilot study was highlighted in the range of omissions that were raised by the participants as being of specific importance to obesity surgery candidates despite not all being reflected in the literature. These were:

- Health status and quality of life status were identified as important outcome indicators for obesity surgery candidates, so these were added along with optional follow-up opportunities for participants to expand on their answers.
- Hyperphagia was also identified as an important factor associated with psychological health, so a question about experience of post-surgical hyperphagia was added.

- The final amendment was the addition of a question related to personal relationships, along with an optional follow-up opportunity for participants to expand their answers, to assess the extent to which the surgery had impacted on those close to the participant.

Thus the main aims of the study were met in respect of testing the feasibility of the measures, item clarification and identifying omissions.

Chapter 5

Obesity surgery and quantitative correlates of subjective well-being

This chapter brings together the findings from the previous studies in this thesis by applying the SWB measures used in the earlier chapters to a unique obesity surgery cohort, in addition to specific demographic factors identified by the qualitative studies. This chapter takes both a nomothetic and ideographic approach to data collection, with overall trends examined alongside individual experiences. This approach adds a narrative element to further contextualize the quantitative findings.

STUDY 9

Obesity surgery quantitative study

This study is novel in respect of being a large scale quantitative study of SWB in participants electing for obesity surgery, and it has a sound theoretical and empirical basis as the content is informed by the previous 2 studies, where participants identified specific mediators of subjective well-being for this population. Unlike most previous studies with a focus on one aspect of a particular form of surgery, this study takes a broad approach and is open to participants undertaking any form of obesity surgery, and at any stage of the process.

The aims of this study were to establish norms of SWB correlates in a severely obese surgical treatment population in a non-clinical setting, and to specifically (i) identify the direction and strength of the relationships between correlates of SWB to establish the impact on both life-satisfaction and self-esteem, (ii) establish the prevalence of eating disorder

symptoms and their relationship with correlates of SWB, (iii) identify differences in SWB profiles among patients who choose different surgery options, (iv) determine levels of satisfaction with surgery outcomes, (v) establish prevalence of anti-depressant medication as a proxy for identifying prevalence of depression, and examine relationships between anti-depressant use and correlates of SWB, (vi) identify the prevalence and nature of post-surgical changes to relationship status, (vii) identify the prevalence of post-surgical hyperphagia and its relationship with correlates of SWB, and (viii) determine post-surgical changes to health and quality of life.

In terms of the direction and strength of the relationships between correlates of SWB and their impact on life-satisfaction and self-esteem, it is hypothesised that the pattern of relationships will follow those previously reported in this thesis, with positive attributes positively correlated with each other and negatively correlated with negative attributes, and that positive correlates of SWB will exert a positive influence of life-satisfaction and self-esteem, while negative correlates of SWB will exert a negative influence of life-satisfaction and self-esteem. However, the amount of variance accounted for by each correlate or cluster of correlates is unknown. It is also predicted that the stable personality factors of extraversion, neuroticism and conscientiousness will exert an influence on life-satisfaction and self-esteem, as these are known to discriminate between people with high and low well-being in the literature (Grant, Langan-Fox, & Anglim, 2009; Bukovic et al., 2012).

In terms of establishing the prevalence of eating disorder symptoms, it is expected that a proportion of obesity surgery candidates would have a co-morbidity of binge eating disorder, but the prevalence is as yet unknown because it is a largely undiagnosed disorder due to unclear classification criteria (Bulik, Brownley & Shapiro, 2007). Bingeing is defined

as eating an unusually large amount of food while feeling out of control, and is often accompanied by other symptoms such as eating when not physically hungry, eating until uncomfortable full, eating alone out of shame, and feelings of self-disgust or guilt associated with eating (DSM-5, 2013). Difficulties in classification relate to quantifying 'an unusually large amount' and differences between 'grazing' and eating clearly defined meals (Bulik, et al., 2007). Allison et al., (2006) found that obesity surgery candidates with a co-morbidity of binge eating disorder did not differ on BMI than those without, so BMI is not a useful predictor of binge eating disorder. The main difference found between the binge eaters and non-binge eaters was that those with binge eating disorder reported significantly more symptoms of depression than those without. The current study will focus on identifying the prevalence of bingeing behaviours in participants and as well as alternate maladaptive post-surgical eating behaviours such as purging, and it is hypothesised that a significant minority will meet the clinical threshold for bingeing as defined by Fairburn and Beglin (1994).

Differences in SWB profiles among patients who choose different surgery options will be associated with a number of key factors that affect the decision, including the amount of weight loss required, cost, experience of surgeon and patient profile. The laparoscopic gastric band, which is the cheapest and least invasive procedure and is based on food restriction alone, is most suitable for those with the least weight to lose and the capacity to reduce food consumption. The more invasive gastric bypass (Roux-en-Y) based on restriction with some mal-absorption, is more suitable for those with more weight to lose who have the capacity to reduce food consumption but require faster weight–loss. The most invasive and most expensive procedure is the Duodenal Switch, which is based mainly on mal-absorption and neuro-hormonal changes, is most suitable for those with most weight to lose who cannot realistically reduce their food consumption, and those with endocrine

complications and diabetes. The Duodenal Switch is however, only available in certain hospitals due to inexperience of surgeons.

It is expected that those patients who opt for the laparoscopic adjustable gastric band would be those who require assistance with food restriction while they shed the excess weight, with an expectation that they would then learn to take responsibility for their food consumption by becoming accustomed to eating less. These patients would perhaps be expected to have fewer physical and psychological complications. It is expected that those patients who opt for the laparoscopic gastric bypass (Roux-en-Y) would have more excess weight and would therefore require faster weight-loss with the additional benefit of mal-absorption. As with the laparoscopic adjustable gastric band, there would be an expectation that they would then learn to take responsibility for their food consumption by becoming accustomed to eating less due to the reduced stomach capacity. It is expected that those patients who opt for the laparoscopic Duodenal Switch, would have the greatest amount of weight to shed and would have the most physical and psychological complications. As this procedure relies on mal-absorption and neuro-hormonal changes, it is an effective treatment for diabetes and allows the patient to continue to consume a large volume of food without benefitting from the calorific intake, so they will lose weight irrespective of the volume of food consumed. This means that weight-loss will not be compromised by psychological drivers to eat.

Determining levels of satisfaction with surgery outcomes is important because patients do not benefit equally from surgery (van Hout et al., 2006), and identifying factors leading to satisfaction could also go some way to explaining the discrepancies in benefit experienced. It is predicted that, based on the physical measure of weight-loss, participants

who undergo the most invasive surgical procedures would report the greatest satisfaction with surgical outcomes because the weight-loss would be faster than for participants who undergo the laparoscopic gastric banding procedure. However, because the participants who opt for the more invasive procedures have the most weight to lose, they may also have a more problematic personality profile which could compromise satisfaction with surgical outcomes.

The comorbidity of obesity and depression is well documented in the literature (Wadden & Sarner, 2006; de Wit et al, 2010; Luppino et al, 2010; Kyron et al, 2011), and it is therefore expected that the prevalence of depression in an obesity surgery sample would be higher than within a non-clinical sample. However, the findings of the pilot study suggest that it would be imprudent to include a measure of depression in an on-line study with a potentially vulnerable obesity surgery sample, so this was excluded from the study. The prevalence of anti-depressant medication was instead used as a proxy for identifying prevalence of depression, and to examine the relationships between anti-depressant use and correlates of SWB. It was predicted that participants taking anti-depressant medication would be depressed, and would therefore report poorer SWB than participants not taking anti-depressant medication.

The findings from Study 6 suggest that post-surgical changes in self-perception could bring about changes in personal relationships, so it is predicted that there would be a high prevalence of post-surgical changes to relationship status.

The findings for the qualitative studies also suggest that post-surgical hyperphagia was associated with bingeing and purging, so establishing the prevalence of post-surgical

hyperphagia could point to issues around eating disorders. It was hypothesised that participants who experienced hyperphagia frequently would report poorer SWB.

The benefits to health and quality of life associated with weight reduction in an overweight population are well documented in the literature (Fontaine, Barofsky, Bartlett, Franckowiak, & Andersen, 2004).), so it is expected that similar benefits will be experienced in a severely obese population experiencing weight-loss following obesity surgery.

Method

Participants

An opportunity sample of obesity surgery candidates (N = 125) self-selected from a closed subscription-based online obesity surgery support group (WLSInfo.org). A research participation information notice was posted on the group forum (see appendix 5A) and participants were invited to contact the researcher for further information or go direct to the website hosting the questionnaires. No participants chose to contact the researcher directly. WLSInfo.org is an online resource with over 9000 members, and it provides information and peer support for people who elect for obesity surgery. This group was chosen because it adopts a strict vetting practice, so only surgery candidates can access it, guaranteeing the obesity surgery status of the participants. Participants were representative of obesity surgery candidates across the UK and included those who were awaiting surgery along with those who had already undergone surgery.

There was a strong gender bias with 116 females and only 9 males, but this is somewhat representative of a typical female dominant obesity surgery cohort. Ages ranged from 25 to 59 years, with a mean age of 42.74 years.

Participants had a good spread of surgical procedures, with 5 participants (2.9%) awaiting surgery, 37 participants (21.8%) having had a laparoscopic gastric band, 65 participants (38.2%) having had a Roux-en-Y gastric bypass, and 18 participants (10.6%) having had the more extreme Duodenal Switch. Time elapsed since surgery ranged from awaiting surgery to 40 months post-surgery, with a mean time elapsed since surgery of 14.82 months.

Current weight ranged from 49kg to 198kg (mean = 99.74, sd = 28.24), and heaviest weight ranged from 90.7kg to 198kg (mean = 143.30, sd = 28.24). The current BMI ranged from 18 to 68.51 (mean = 36.33, sd = 10.44), and heaviest BMI ranged from 35.29 to 86.02 (mean = 52.00, sd = 10.52). Total weight loss to date ranged from 0 to 117kg (mean = 44, sd = 24.63).

Design

This is a cross-sectional quantitative study testing the findings generated from the previous qualitative study, along with establishing group norms for the measures of correlates of subjective well-being. The independent variables are the demographic factors and the dependent variables are the correlates of subjective well-being. In addition, participants could offer qualitative answers relating to their health and quality of life, but these questions were optional. This qualitative element was analysed using a simple content analysis method,

Materials

A booklet of measures was created to assess correlates of SWB and appearance anxiety in an obesity surgery cohort. The validated measures were largely the same as in the previous studies, namely the *Life Orientation Test - Revised* (LOT, Carver & Scheier, 1985), the *Satisfaction with Life Scale* (SWLS, Diener et al., 1985), the *Physical Appearance State and Trait Anxiety Scale* (PASTAS, Reed et al., 1991), Extraversion and Neuroticism from *The Big 5* (Costa & McCrae, 1985), *Self-esteem* (Rosenberg, 1965), *Self-efficacy* (Schwarzer, & Jerusalem, 1995) and the *Eating Disorder Examination-Questionnaire* (EDE-Q; Fairburn & Beglin, 2008).

Demographic questions

In addition to the validated measures, a number of demographic questions were asked to build up a profile of the obesity surgery candidates. These included standard demographic questions such as age and gender, surgical procedure, time elapsed since surgery, and previous and current weight to establish BMI and weight loss, along with the more specific health and quality of life questions, some of which had open-ended qualitative answers. In addition to the physical health questions, participants were asked about use of anti-depressant medication as a proxy measure for mental health. Post-surgical hyperphagia, where participants experience an extreme unsatisfied need to consume food despite a lack of physical hunger or appetite and a knowledge that it could result in pain or vomiting, was included and described as 'head hunger', a term coined by a participant in the previous study.

Procedure

The measures were collated into an electronic booklet and data were collected on-line using Bristol Online Surveys (BOS). The link to the booklet was sent to the administrators of the patient forum on WLSInfo.org, who then posted the link on the forum on the researcher's behalf. The data were held by BOS, and downloaded by the researcher. Data collection was initially very slow, but after a few people had taken part this led to discussions about the research on the forum and participation increased. The link remained live for 3 months, by which time participation had petered out. A message was then posted on the forum to thank members for their participation and the main findings were also posted following analysis, which generated further discussion.

Ethical considerations

Ethical approval for this study was granted by the Liverpool John Moores University Ethics Committee and permission to recruit from the WLSInfo.org website was granted by Mr Ken Clare, the group founder. Ethical issues related to the sensitivity of some of the questions, but these had been piloted on the small group of qualitative participants and had been approved as fit for purpose.

There was no control group used in this study because obese people seeking surgical treatment differ from those not seeking treatment (van Hout et al., 2007) and it would be unethical to expect those seeking surgery to wait for treatment in order that a control group could be artificially created.

Results

Data reliability and validity

The Cronbach's α scores across the variables are acceptable at >0.6 so the data can be considered reliable. The normality statistics shown in Table 5.1 demonstrate that the data were generally normally distributed, with scores for both skewness and kurtosis being small across all the measures apart from Agreeableness, which demonstrates a leptokurtic distribution, with kurtosis being above the significant cut-off point (1.96). This anomaly could be a peculiarity of the sample, with a very high mean score for Agreeableness and scores clustered about the mean perhaps being associated with in increased desire to be liked from a sample that is often marginalised in the community.

Table 5.1: Cronbach's α, Skewness and Kurtosis for the six dimensions of self-report measures

	Cronbach's α	Skewness	Kurtosis
LOT	0.92	-0.15	0.86
SWLS	0.97	-0.35	0.71
PASTAS	0.91	0.75	1.16
S/EST	0.96	-0.30	0.13
S/EFF	0.96	-0.17	0.92
O	0.64	-0.48	0.11
C	0.63	-0.14	-0.72
E	0.84	-0.24	0.52
A	0.76	-1.63	3.45
N	0.84	-0.17	-0.46

LOT = Life Orientation Test, SWLS = Satisfaction with Life Scale, PASTAS = Physical Appearance State and Trait Anxiety Scale, S/EST = Self-esteem, S/EFF = Self-efficacy, O = Openness, C = Conscientiousness, E = Extraversion, A = Agreeableness, N = Neuroticism.

Descriptive Statistics

The descriptive statistics are shown in Table 5.2 below and demonstrate a unique cluster of factors associated with a long-term obese cohort.

Table 5.2: Descriptive statistics for the six self-report measures

	Mean	SD	Mid-Point of Scale	Actual Range	Possible Range
LOT	18.63	5.24	20	7-30	7-35
SWLS	20.43	7.31	20	5-35	5-35
PASTAS	21.74	11.34	32	0-64	0-64
S/EST	33.78	7.69	30	13-50	10-50
S/EFF	41.92	7.16	36	21-60	12-60
O	35.62	6.34	25	16-46	5-45
C	33.01	6.91	25	17-48	5-45
E	32.46	9.81	25	10-50	5-45
A	42.90	6.45	25	17-50	5-45
N	31.17	8.94	25	10-50	5-45

LOT = Life Orientation Test, SWLS = Satisfaction with Life Scale, PASTAS = Physical Appearance State and Trait Anxiety Scale, S/EST = Self-Esteem, S/EFF = Self-Efficacy, O = Openness, C = Conscientiousness, E = Extraversion, A = Agreeableness, N = Neuroticism.

As expected, the mean scores for openness (O), conscientiousness (C) and extraversion (E) were in the positive parameters, above the mid-point of the scales, the standard deviations were appropriate for the number of items in each measure, and most of the scale was used in each measure. The mean score for agreeableness (A) was very high with scores clustered about the mean, suggesting a slightly higher than expected conformity in scoring that could explain some of the personality peculiarities of an obesity surgery sample. The mean score for neuroticism was also in the higher parameter of the scale, and

was much greater than would be expected on a normative adult sample. This may be as expected for an obesity surgery sample of participants who may have feelings of insecurity in having to respond to changes in life circumstances.

An examination of the mean scores of the measures shows that dispositional optimism (LOT) was in the negative parameters of the scale, suggesting a cohort that tends towards pessimism, and life satisfaction (SWLS) was at the mid-point of the scale, suggesting a moderate level of life-satisfaction, in addition, physical appearance anxiety (PASTAS) was in the negative parameter (21.74), indicating a lower than expected level of appearance anxiety across the cohort. The standard deviation (11.34) suggests a good spread of scores across this measure, and the whole of the measure was used with participant's scoring extremes at both ends of the scale.

The mean scores for self-esteem and self-efficacy are both nestled in the positive parameters of the scales, just above the mid-points, and the standard deviations are appropriate for the measures and bring out individual differences in the cohort. For both measures, the minimum score recorded was just above the absolute minimum and the maximum score recorded was the highest possible score, demonstrating the full range of scores was used.

Correlations

The measures were correlated to identify the relationship between the variables, as shown in Table 5.3 below. As expected, the correlations were moderate and positive across the measures, with the exception of neuroticism and physical appearance anxiety, which were positively correlated with each other and negatively correlated with the other measures. Optimism appears to have a strong and systematic impact on all adaptive outcomes.

Table 5.3: Correlation coefficients for self-report personality measures and correlates of SWB

	SWLS	PASTAS	S/EST	S/EFF	O	C	E	A	N
LOT	.57**	-.41**	.73**	.61**	.34**	.32**	.46**	.03	-.59**
SWLS		-.32**	.57**	.47**	.23**	.34**	.39**	.09	-.37**
PASTAS			-.52**	-.29**	-.29**	-.16*	-.39**	-.10	.18*
S/EST				.69**	.52**	.35**	.65**	.18*	-.57**
S/EFF					.42**	.37**	.45**	.18*	-.45**
O			.			.05	.45**	.27**	-.25**
C							.29**	.08	-.29**
E								.29**	-.46**
A									-.03

**p< .05, **p<.01. LOT = Life orientation test. SWLS = Satisfaction with life scale. PASTAS = Physical appearance state and trait anxiety scale. S/EST = Self-esteem. S/EFF = Self-efficacy. O = Openness. C = Conscientiousness. E = Extraversion. A = Agreeableness. N = Neuroticism.*

There was a strong positive correlation between dispositional optimism and life satisfaction (.57, p<.01), self-esteem (.73, *p*<.01), and self-efficacy (.61, *p*<.01), and a moderate positive correlation with openness (.34, *p*<.01), conscientiousness (.32, *p*<.01) and extraversion (.46, *p*<.01), suggesting that participants who had an optimistic outlook on life benefitted from greater life satisfaction, and higher self-esteem and self-efficacy than those with a more pessimistic outlook on life. The optimists were also more likely to be open, conscientious and extravert than the pessimists. There was also a strong negative correlation between dispositional optimism and physical appearance anxiety (-.41, *p*<.01) and neuroticism (-.59, *p*<.01), suggesting that optimists are less anxious about their appearance and more emotionally stable. This is as expected and demonstrates consistency across the measures.

Life satisfaction followed a similar pattern to dispositional optimism and was found to be positively correlated with self-esteem (.57, *p*<.01), self-efficacy (.47, *p*<.01), extraversion (.39, *p*<.01), conscientiousness (.34, *p*<.01), and negatively correlated with neuroticism (-.37, *p*<.01) and physical appearance anxiety (-.32, *p*<.01). Self-esteem and self-efficacy performed as expected; they were strongly positively correlated with each other (.69, *p*<.01), and correlated as predicted with the other correlates of subjective well-being, they were positively correlated with openness (.56, *p*<.01 and .42, *p*<.01 respectively), conscientiousness (.35, *p*<.01 and .37, *p*<.01 respectively), and extraversion (.65, *p*<.01 and .45, *p*<.01 respectively), and negatively correlated with neuroticism (-.57, *p*<.01 and -.45, *p*<.01 respectively).

Of the five factors of personality, openness, conscientiousness and extraversion correlated positively with each other and with positive correlates of SWB. Extraversion

appeared to be the most consistent personality factor across the five well-being indicators, suggesting it could be an important predictor of SWB. Neuroticism correlated negatively with positive attributes and positively with physical appearance anxiety, and agreeableness was largely unrelated to the other factors. Again, these patterns were as expected, demonstrating consistency across the measures.

Path Analysis

The correlation findings suggest hierarchical path analysis with the internal personality factors of extraversion, neuroticism and conscientiousness being the initial predictors, followed by dispositional optimism and self-efficacy which are learned behaviours that influence outcomes. These will combine to predict the variance on the outcome variables of life satisfaction and self-esteem.

Analysis revealed multivariate normality within both path models (life satisfaction model = 2.897, C.R. = 1.65, $p>0.05$; self-esteem model = 4.518, C.R. = 2.58, $p>0.05$), but bootstrapping using the maximum likelihood 95% confidence interval was applied because of the small sample size.

Life satisfaction

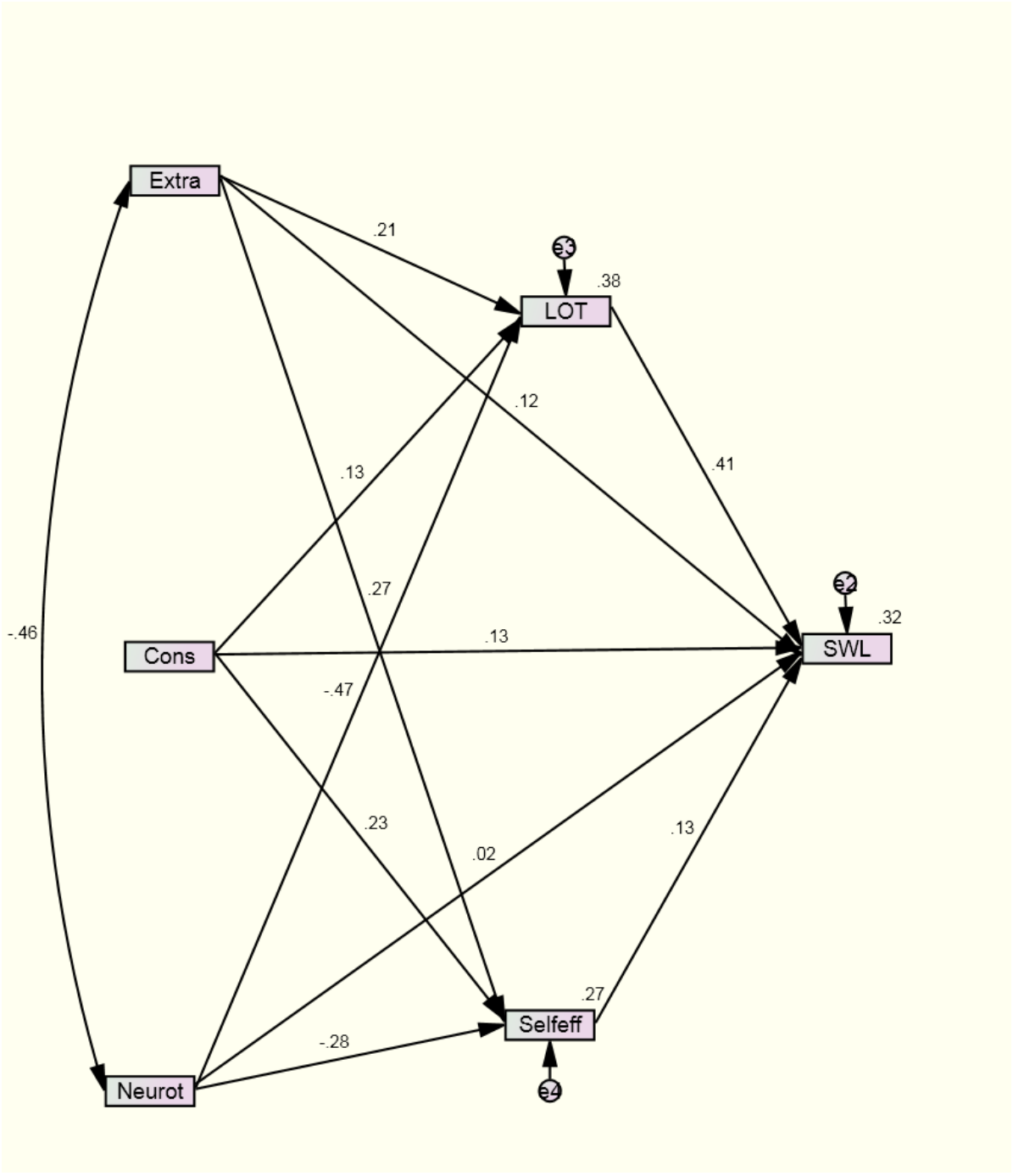
The direct, indirect and total effects for the life satisfaction path model are reported in Table 5.4 and illustrated in Figure 5.1, and show that the measures in the model accounts for 32% of the variance in life satisfaction for this obesity surgery cohort. The effects of both extraversion and conscientiousness have been partially mediated through dispositional optimism and self-efficacy. The relationship between neuroticism and life-satisfaction was statistically significant in zero order correlation (r=-0.37, $p<0.01$), but this has been entirely mediated by dispositional optimism and self-efficacy in the path analysis ($\beta = 0.02$). However, the relationship between neuroticism and dispositional optimism remains strong and statistically significant ($\beta = -0.47$, $p<0.01$), with dispositional optimism being the strongest direct predictor of life satisfaction ($\beta = 0.41$, $p<0.01$). Although the total effect of conscientiousness is reported as statistically non-significant, it is almost significant at $p = 0.056$ for a two tailed test.

Both extraversion and neuroticism were statistically significant through the indirect pathways, via optimism and self-efficacy, (p<0.05). However, the route from conscientiousness through the same pathway was only significant on a one-tailed test (p<0.05).

Table 5.4: Direct, indirect and total effects for the life-satisfaction path model

Outcome	Determinant	Standardised estimates		
		Direct	Indirect (CI's 95%)	Total
Satisfaction	E	0.12	0.12 (0.02 to 0.26)*	0.24*
with Life	C	0.13	0.08 (0.00 to 0.17)*[1]	0.21
(R^2 = 0.32)	N	0.02	-0.23 (-0.35 to -0.13)*	0.21**
	LOT	0.41	-------	0.41**
	S/EFF	0.13	-------	0.13

**[1]p<0.05 (one-tailed test), *p<0.05, **. p<0.01. CI's = Confidence Intervals (95% Upper and Lower Boundaries). E = Extraversion. C = Conscientiousness. N = Neuroticism. LOT = Dispositional Optimism. S/EFF = Self-efficacy.*



Extra = Extraversion. Cons = Conscientiousness. Neurot = Neuroticism. LOT = Dispositional Optimism. Selfeff = Self-esteem. SWL = Satisfaction with Life.

Figure 5.1: Path model of impact of extraversion, conscientiousness, neuroticism, optimism and self-efficacy on life satisfaction

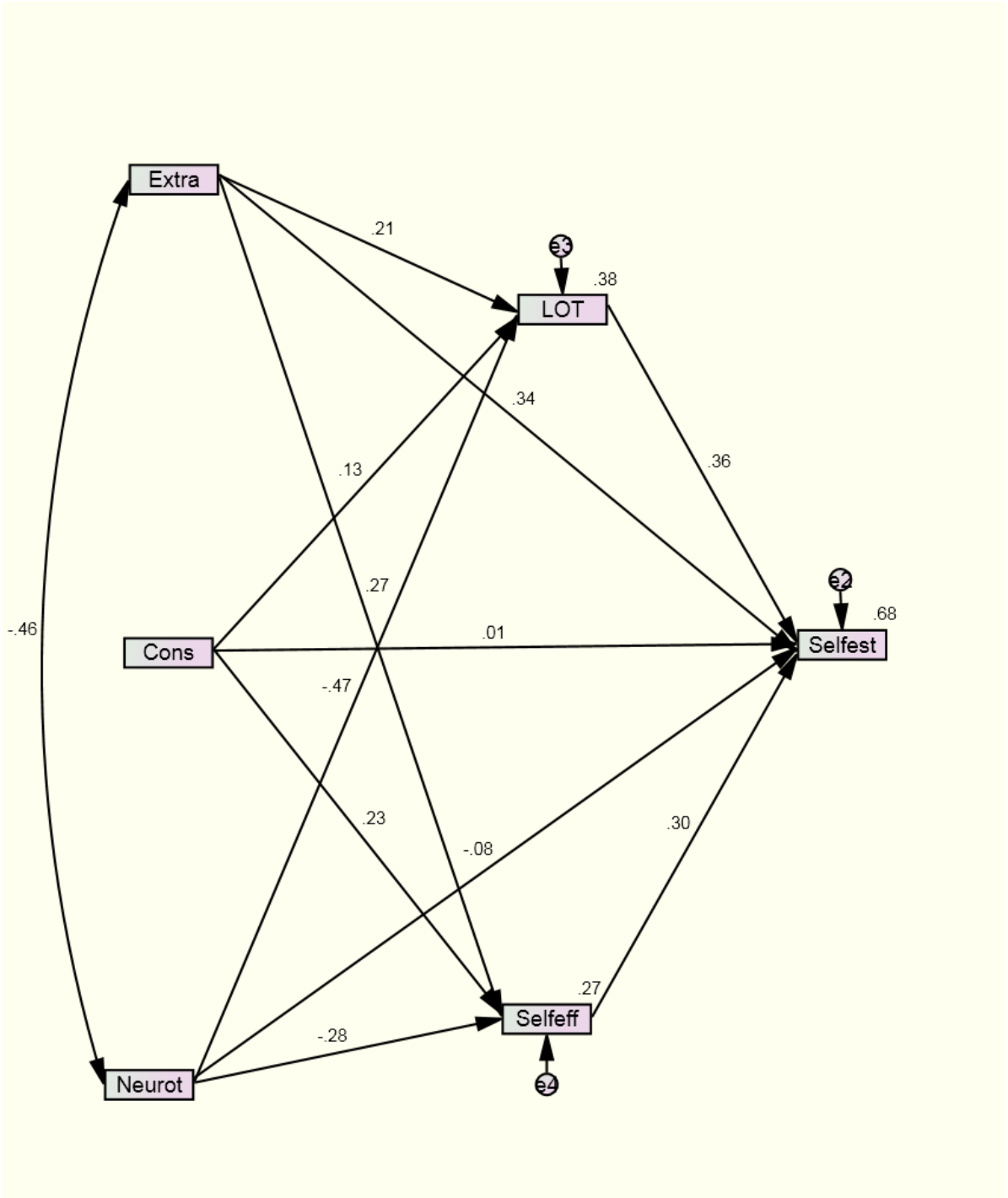
Self-esteem

The direct, indirect and total effects for the life satisfaction path model are reported in Table 5.5 and illustrated in Figure 5.2, and show that the measures in the model accounts for 68% of the variance in self-esteem for this obesity surgery cohort. The relationship between extraversion and self-esteem was strong and statistically significant in zero order correlation ($r = 0.65$, $p<0.01$), and although reduced in the path analysis ($\beta = 0.34$), it has been partially mediated through dispositional optimism ($\beta = 0.21$), and self-efficacy ($\beta = 0.27$, $p<0.01$). The relationship between neuroticism and self-esteem was also statistically significant in zero order correlation ($r = -0.57$, $p<0.01$), and this has been almost entirely mediated by dispositional optimism ($\beta = -0.47$, $p<0.01$), and self-efficacy ($\beta = -0.28$), in the path analysis ($\beta = -0.08$). This is replicated in the relationship between conscientiousness and self-esteem, which was also almost entirely mediated by dispositional optimism ($\beta = 0.13$, $p<0.05$), and self-efficacy ($\beta = 0.23$), in the path analysis. Therefore the personality factors exerted an indirect effect on self-esteem via optimism and self-efficacy, and this indirect effect remained statistically significant and was stronger in both extraversion and neuroticism ($p<0.01$) than conscientiousness ($p<0.05$). The direct effect of both dispositional optimism ($\beta = 0.36$, $p<0.01$), and self-efficacy ($\beta = 0.30$, $p<0.01$), remains strong and statistically significant.

Table 5.5: Direct, indirect and total effects for the self-esteem path model

Outcome	Determinant	Standardised estimates		
		Direct	Indirect (CI's 95%)	Total
Self-esteem	E	0.34	0.16 (0.09 to 0.25)**	0.50**
(R^2 = 0.68)	C	0.01	0.12 (0.03 to 0.24)*	0.13*
	N	-0.08	-0.23 (-0.37 to -0.17)**	0.31**
	LOT	0.36	-------	0.36**
	S/EFF	0.30	-------	0.30**

**p<0.05, **. p<0.01. CI's = Confidence Intervals (95% Upper and Lower Boundaries). E = Extraversion. C = Conscientiousness. N = Neuroticism. LOT = Dispositional Optimism. S/EFF = Self-efficacy.*



Extra = Extraversion. Cons = Conscientiousness. Neurot = Neuroticism. LOT = Dispositional Optimism. Selfeff = Self-esteem. SWL = Satisfaction with Life.

Figure 5.2: Path model of impact of extraversion, conscientiousness, neuroticism, optimism and self-efficacy on self-esteem

Demographic quality of life statistics

Prevalence of eating disorder symptoms

Prevalence of symptoms of eating disorders were assessed specifically in relation to bingeing and purging by examining responses to the subscales eating concern, shape concern and weight concern from the EDE-Q (Fairburn, & Beglin, 2008). The 3 subscales were strongly positively correlated with each other (eating/shape, r = 0.45, $p<.01$; eating/weight, r = 0.45, $p<.01$; weight/shape, r = 0.63, $p<.01$), suggesting that participants who scored highly on one scale were also likely to score high on the other 2 scales, further demonstrating data reliability. The descriptive statistics shown in table 5.6 below demonstrate measures of central tendency and dispersion that would suggest a non-clinical sample with mean scores below the clinical threshold for binge eating disorder as defined by Fairburn & Beglin (2008), but the range of scores would suggest some participants met the clinical threshold for binge eating disorder. It should also be noted that an outlier on the eating concern subscale skewed the data.

Table 5.6: Descriptive statistics for the three eating disorders sub-scales

Subscale	Mean (sd)	Clinical threshold	Range of scores
Eating Concern	20.38 (36.23)	≥24	0-252
Shape Concern	4.73 (5.11)	≥12	0-18
Weight Concern	20.30 (11.56)	≥28	0-42

Eating concern (EDE-Q)

Table 5.6 shows that the mean score for the sub-scale eating concern (≥24) is within the non-clinical boundary as defined by Fairburn, & Beglin (2008). However, this overall score is misleading because the scale is made up of three items concerning purging (the prevalence of which is extremely low in this sample) and three items relating to binge eating (the prevalence of which is really high in this sample), so the combined score is not representative.

When examined individually, the three items relating to binge eating and loss of control generated mean scores that fit with a clinical population (≥4). Results for the item on eating an unusually large amount of food (mean = 6.88, sd = 12.99) demonstrate that 45 respondents (36% of cohort) would fall within a clinical sample. This is pattern replicated for the item on loss of control when bingeing (mean = 6.13, sd = 12.79, 43 respondents, 34.40% of cohort would fall within a clinical sample) and frequency of bingeing (mean = 4.83, sd = 8.31, 38 respondents, 30.04% of cohort would fall within a clinical sample), suggesting that about a third of the sample binge eat on a regular basis.

Taken individually, the three items of eating concern relating to purging generated mean scores that fit with a non-clinical population (<4). Results for the item on self-induced vomiting (mean = 1.62, sd = 7.07) demonstrate that only 9 respondents (7.2% of cohort) would fall within a clinical sample. This is pattern replicated for the item on laxative misuse (mean = 0.57, sd = 3.48, 4 respondents, 3% of sample) and compulsive exercise (mean = 0.57. sd = 2.58, 5 respondents, 4% of sample), suggesting that purging is rare in this cohort.

Shape concern (EDE-Q)

The three items of shape concern generated mean scores that fit with a non-clinical population (<4). Results for the item on eating in secret (mean = 1.19, sd = 1.94) demonstrate that 22 respondents (17.6% of cohort) would fall within a clinical sample, and 12 respondents reported that they eat in secret every day. This is pattern replicated for the item on feeling guilty when eating (mean = 2.07, sd = 2.30, 22 respondents in clinical sample, 18% of cohort) with 21 respondents reporting that they feel guilty every time they eat, and the item on concern about others seeing you eat (mean = 1.46, sd = 2.02, 29 respondents in clinical sample, 23% of cohort), with 9 respondents reporting that they feel extreme concern if others see them eat. This suggests that most of the cohort would fit with a non-clinical sample, but about one fifth would meet the clinical threshold for shape concern. This supports the findings of Diaz et al. (2012) who suggested that 18-20% of obesity surgery candidates make up a distinct sub-group with a co-morbidity of binge eating disorder.

Weight concern

The seven items of weight concern generated mean scores that fit with a non-clinical population (<4). Descriptive statistics for each item show that although the mean scores suggest a non-clinical sample; a significant minority of participants would report sufficient weight concern to meet the clinical threshold for eating disorders, suggesting that they are dissatisfied with themselves and self-punitive. This is shown in Table 5.7.

The item on the weight concern sub-scale that yielded the healthiest response set was the extent to which an individual would be upset at being weighed. Given that this is an obesity surgery cohort, it is expected that this would not be an item that would cause distress

because being weighed would be part of the monitoring process and participants would be habituated to it.

Table 5.7: Descriptive statistics for subscale weight concern (EDE-Q)

Item	Mean (sd)	Proportion meeting clinical threshold	Number reporting maximum value
Judge self because of weight	3.19 (2.35)	63 (50.4%)	34
Judge self because of shape	3.21 (2.29)	65 (52%)	33
Upset by being weighed	1.38 (2.07)	26 (20.8%)	12
Dissatisfied with weight	2.82 (2.19)	52 (41.6%)	25
Dissatisfied with shape	3.38 (2.12)	50 (40%)	29
Discomfort seeing own body	3.02 (2.24)	44 (35.2%)	29
Discomfort others seeing figure	3.39 (2.32)	56 (44.8%)	37

The clinical threshold as defined by Fairburn, & Beglin (2008) is >4.

Binge eating disorder sub-scales and correlates of subjective well-being

The relationship between the binge eating disorder subscales and the correlates of subjective well-being was explored and the direction of the relationships were as expected,

with the binge eating disorder subscales being negatively correlated with the positive correlates of subjective well-being and positively correlated with neuroticism and physical appearance anxiety. This is shown in Table 5.8.

Table 5.8: Correlations of binge eating disorder sub-scales and correlates of SWB

Measure	Eating concern	Shape concern	Weight concern
LOT	-0.21**	-0.31**	-0.40**
SWLS	-0.25**	-0.44**	-0.21**
PASTAS	0.46**	0.60**	0.39**
S/SEST	-0.42**	-0.51**	-0.31**
S/EFF	-0.30**	-0.34**	-0.32**
O	-0.23**	-0.20*	-0.18*
C	-0.03	-0.13	-0.12
E	-0.35**	-0.33**	-0.07
A	-0.07	-0.10	-0.18*
N	0.21**	0.30**	0.21**

*** p< .01. * p< .05. LOT = Life orientation test. SWLS = Satisfaction with life scale. PASTAS = Physical appearance state and trait anxiety scale. S/EST = Self-esteem. S/EFF = Self-efficacy. O = Openness. C = Conscientiousness. E = Extraversion. A = Agreeableness. N = Neuroticism.*

Of the 3 binge eating disorder sub-scales, shape concern appears to be most strongly associated with the correlates of subjective well-being. This sub-scale taps into anxiety about being judged for eating and relates specifically to feeling guilty about eating, eating in secret and concern at being visible when eating. As expected, physical appearance anxiety was strongly correlated with shape concern (r = 0.60, p<.01), but it was only moderately correlated with eating concern (r = 0.46, p<.01) and weight concern (r = 0.39, p<.01). Self-esteem was moderately negatively correlated across the 3 sub-scales, and shape concern was

again the strongest relationship (r = 0.51, p<.01). Life satisfaction was moderately associated with shape concern (r = -0.44, p<.01), but weakly associated with eating concern (r = -0.25, p<.01) and weight concern (r = -0.21, p<.01). The remaining correlates of subjective well-being were all weakly negatively correlated with binge eating disorders sub-scales (r = -0.21, p<.01 to r = -0.40, p<.01).

The 2 personality factors associated with subjective well-being; extraversion and neuroticism, were weakly associated with the binge eating disorders subscales. Openness was also weakly associated with the eating disorders sub-scales but there was little or no relationship found between the binge eating disorder subscales and conscientiousness or agreeableness.

Choice of surgical procedure

The decision about the type of bariatric surgery undertaken is affected by a number of key factors including the personal physical and psychological profile of the patient. It is expected that those patients who opt for different types of obesity surgery will have different psychological profiles, with those who choose the laparoscopic adjustable gastric band having fewer physical and psychological complications than those who choose the more invasive laparoscopic gastric bypass (Roux-en-Y) or Duodenal Switch. It is also expected that those who opt for the Duodenal Switch feel least able to address their inappropriate eating behaviours, because this procedure allows the patient to continue to eat a large volume of food following surgery. When examining the heaviest recorded weight of the participants, Tukey's post hoc test revealed that the laparoscopic adjustable gastric band patients had a significantly lower pre-surgical weight (mean = 126.16kg) than both the laparoscopic gastric bypass patients (mean = 150.50kg) and the duodenal switch patients (mean = 154.62kg), $F = 6.38$, $p<0.001$.

The impact of the type of surgery on personality factors and correlates of subjective well-being was examined, and the findings are shown in Tables 5.9 (personality factors) and 5.10 (correlates of subjective well-being).

The five factors of personality were largely consistent across the groups. Extraversion was the only factor that demonstrated a difference due to surgery type chosen, with those who chose the gastric bypass reporting slightly lower extraversion (mean = 30.09) than those who chose the gastric band (mean = 35) or the Duodenal switch (35.94), $p<0.05$.

Table 5.9: Descriptive statistics and ANOVAs (one-way) for four surgery groups on the big five self-report measures of personality

	Awaiting Surgery (n=5) Mean (sd)	Gastric Band (n=37) Mean (sd)	Gastric Bypass (n=76) Mean (sd)	Duodenal Switch (n=18) Mean (sd)	F-test
O	39.6	36.32	34.48	37.22	1.94
	(6.35)	(5.20)	(7.23)	(4.03)	
C	34.20	34.92	31.51	34.17	2.25
	(7.29)	(5.84)	(7.13)	(7.37)	
E	32.00	35.00	30.09	35.94	2.98*
	(13.38)	(8.99)	(10.33)	(6.25)	
A	43.00	42.46	42.58	44.94	0.71
	(3.81)	(6.88)	(6.82)	(4.10)	
N	31.60	30.08	31.57	31.83	0.26
	(10.46)	(8.26)	(9.44)	(8.62)	

** p< .05. O = Openness. C = Conscientiousness. E = Extraversion. A = Agreeableness. N = Neuroticism*

As expected, those participants who opted for the laparoscopic gastric band reported the least problematic profile in terms of correlates of subjective well-being. They reported significantly higher dispositional optimism ($p<0.01$), significantly lower physical appearance anxiety ($p<0.001$), significantly higher self-esteem ($p<0.01$), and significantly greater life satisfaction ($p<0.05$) than those who opted for the more invasive procedures.

Although the difference in self-efficacy was not statistically significant, the laparoscopic gastric band participants also reported the highest levels.

Table 5.10: Descriptive statistics and ANOVAs (one-way) for four surgery groups on five self-report measures

	Awaiting Surgery (n=5) Mean (sd)	Gastric Band (n=37) Mean (sd)	Gastric Bypass (n=76) Mean (sd)	Duodenal Switch (n=18) Mean (sd)	F-test
LOT	20.60	20.70	17.31	18.61	3.79**
	(3.44)	(4.74)	(5.23)	(5.41)	
PASTAS	35.80	18.00	23.68	18.50	5.58***
	(10.26)	(9.27)	(11.31)	(11.65)	
S/EST	36.20	36.97	31.92	33.28	3.83**
	(6.57)	(6.18)	(8.63)	(4.68)	
S/EFF	42.00	43.24	41.51	41.94	0.67
	(6.04)	(6.66)	(7.86)	(5.69)	
SWLS	20.00	23.27	19.03	19.78	2.83*
	(9.08)	(5.93)	(7.90)	(5.90)	

** p< .05. ** p< .01 *** p< .001. LOT = Life Orientation Test. PASTAS = Physical Appearance State and Trait Anxiety Scale. S/EST = Self-esteem. S/EFF = Self-efficacy. SWLS = Satisfaction with Life Scale.*

The psychological profiles for those participants opting for the Roux-en-Y and the Duodenal Switch were largely similar, with the exception of physical appearance anxiety which was significantly greater in the Roux-en-Y group (mean = 23.68) than the Duodenal Switch group (mean = 18.50). This could be explained by the probability that those opting

for the Duodenal Switch would be much more likely to be suffer from additional physical illnesses such as diabetes, so could be motivated to have obesity surgery by physical health factors, whereas the Roux-en-Y participants may be more motivated by psychosocial factors such as embarrassment about how they look.

Satisfaction with surgery

Given that obesity surgery patients often have unrealistic expectations about the outcomes of surgery (Price et al., 2013), participants were asked to rate the extent to which they were satisfied with the outcomes of the surgery on a scale ranging from 1 (very unsatisfied) to 5 (very satisfied). Heaviest weight was strongly positively correlated with current weight ($r = 0.64$, $p<.01$), suggesting that weight-loss was proportionate across the cohort, so differences in satisfaction would be due to other factors. Moreover, time elapsed since surgery was moderately negatively correlated with current weight ($r = -0.43$, $p<.01$), suggesting that weight-loss continues over time so time should not be a predictor of satisfaction.

Frequency data suggests that overall 101 participants in this cohort were satisfied with the outcomes of the surgery compared to only 13 participants who were not satisfied. Satisfaction with surgery was moderately negatively correlated with current weight ($r = -0.24$, $p<.01$), suggesting that those who had achieved the lowest weight were most satisfied. Surgery satisfaction was also moderately positively correlated with surgical procedure ($r = 0.28$, $p<.01$), suggesting that the participants who had the more complex surgery involving mal-absorption in addition to restriction, were most satisfied.

Of the 125 participants, 7 respondents were awaiting surgery so the question was not applicable. Only 5 respondents were very unsatisfied and a further 8 were a little unsatisfied. Four respondents were neither satisfied nor unsatisfied. On the positive parameter of the scale, 25 respondents were a little satisfied and 76 respondents were very satisfied.

The relationship between satisfaction with surgery and physical appearance anxiety was examined and it was found that those participants who were very unsatisfied with the outcomes of the obesity surgery reported significantly higher physical appearance anxiety (mean = 37) than those who were a little unsatisfied (mean = 21.13), neutral (mean = 19.75), a little satisfied (mean = 22.60) and very satisfied (mean = 19.07), $F = 7.27$, $p<0.001$.

The association between satisfaction with surgery and symptoms of binge eating disorder was also examined, as it would be expected that those with most symptoms would be least satisfied due to dietary restrictions. There was found to be a strong negative association between eating concern and surgery satisfaction ($r = -0.51$, $p<.01$), a moderate negative association between shape concern and surgery satisfaction ($r = -0.39$, $p<.01$), and a strong negative association between weight concern and surgery satisfaction ($r = -0.52$, $p<.01$), suggesting that those with the greatest number of bingeing symptoms were the least satisfied with the surgery outcomes.

Use of anti-depressant medication

In terms of using anti-depressant medication as a proxy measure for mental health, 51 participants (40.8%) were currently using anti-depressants, a further 39 participants (31.2%) had used them in the previous 6 months, 4 participants (3.2%) had used them in the previous year, 5 participants (4%) had used them over a year ago, while only 26 participants (20.8%) had never used anti-depressants. For the purpose of analysis, these groups were combined to create groups with more substantial cell sizes; current anti-depressant users (51), past users (48) and those who did not use anti-depressants (26).

Table 5.11 shows the group differences on personality factors between those who are currently taking anti-depressant medication, those who have previously taken anti-depressant medication and those who have never taken anti-depressant medication, and demonstrates significant differences across all factors except agreeableness.

The 4 discriminating factors demonstrate a consistent profile across the 3 groups, with extremes at either end (on medication / never used medication). Participants who are currently using anti-depressant medication have reported significantly higher openness ($p<0.01$), higher conscientiousness ($p<0.05$), higher extraversion ($p<0.05$), and lower neuroticism ($p<0.001$) than participants who have never used anti-depressant medication. This suggests that those who use anti-depressant medications have a more positive personality profile than those who do not, so perhaps it would be more appropriate to view use of anti-depressant medication as a proxy for willingness to accept and deal with mental health complications rather than depression per se.

Table 5.11: Descriptive statistics and ANOVAs (one-way) for use of anti-depressant medication on the big five self-report measures of personality

	Using ADM (n=51) Mean (sd)	Past use (n=48) Mean (sd)	Never used (n=26) Mean (sd)	F-test
O	37.47	35.13	32.92	4.97**
	(6.03)	(5.12)	(7.90)	
C	34.82	32.44	30.50	3.80*
	(6.83)	(5.66)	(8.34)	
E	34.27	32.98	27.96	3.84*
	(8.32)	(10.78)	(9.63)	
A	42.14	43.69	42.96	0.72
	(7.32)	(5.71)	(5.95)	
N	27.43	32.35	36.31	10.58***
	(8.38)	(7.85)	(9.05)	

** p< .05, **p<.01. ***p<.001. ADM = anti-depressant medication. O = Openness. C = Conscientiousness. E = Extraversion. A = Agreeableness. N = Neuroticism*

The direction of the means across the 4 personality variables generating significant differences is remarkable because it is linear, as illustrated in Figures 5.3 to 5.6.

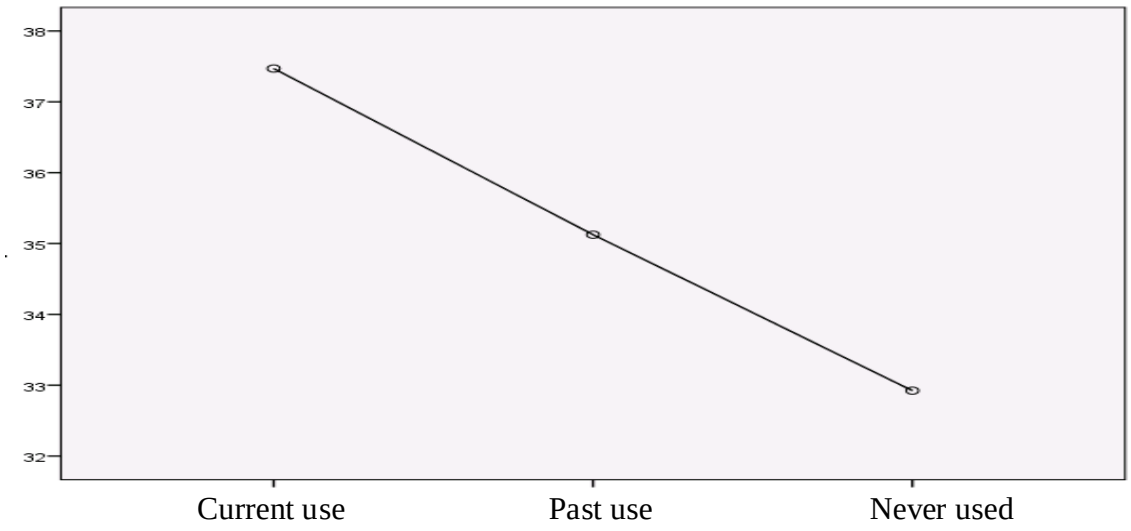


Figure 5.3: Mean scores for openness across categories of anti-depressant use

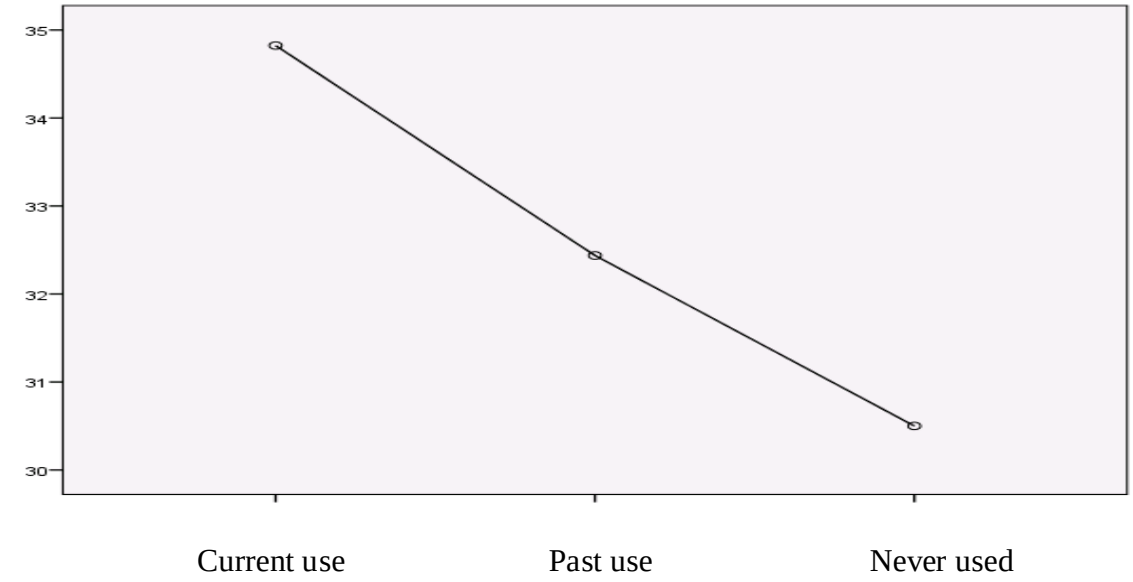


Figure 5.4: Mean scores for conscientiousness across categories of anti-depressant use

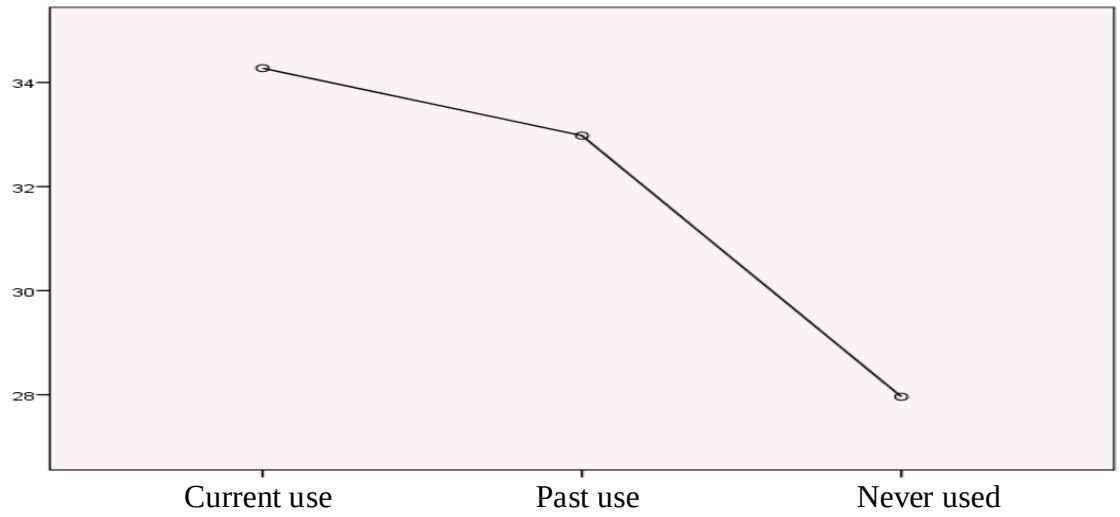


Figure 5.5: Mean scores for extraversion across categories of anti-depressant use

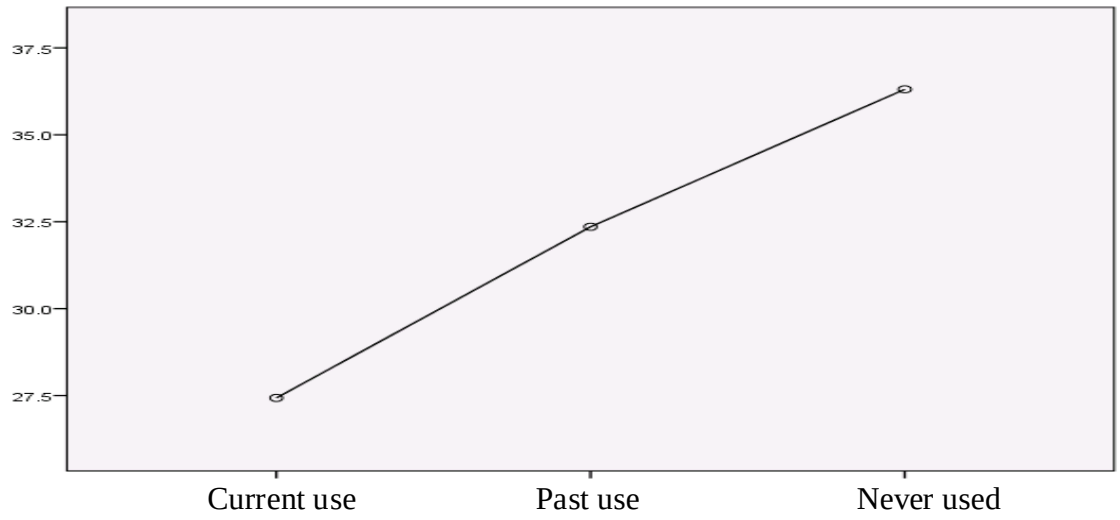


Figure 5.6: Mean scores for neuroticism across categories of anti-depressant use

Table 5.12 shows the group differences on correlates of subjective well-being between those who are currently taking anti-depressant medication, those who have previously taken anti-depressant medication and those who have never taken anti-depressant medication, and demonstrates significant differences across all correlates. As with the personality factors, those currently using anti-depressant medication have the most positive profile overall, and report significantly higher dispositional optimism ($p<0.001$), greater

self-esteem ($p<0.001$), greater self-efficacy ($p<0.001$), and higher life satisfaction ($p<0.01$) than those who have never taken anti-depressant medication.

Table 5.12: Descriptive statistics and ANOVAs (one-way) for use of anti-depressant medication on five self-report measures

	Using ADM (n=51) Mean (sd)	Past use (n=48) Mean (sd)	Never used (n=26) Mean (sd)	F-test
LOT	20.29	18.85	14.96	10.36***
	(4.73)	(4.98)	(4.99)	
PASTAS	21.04	18.92	28.31	6.47**
	(10.52)	(9.26)	(13.93)	
S/EST	36.51	33.65	28.69	10.25***
	(6.90)	(6.46)	(8.80)	
S/EFF	45.08	41.13	37.19	13.07***
	(6.07)	(6.58)	(7.32)	
SWLS	22.49	20.06	17.08	5.15**
	(7.02)	(6.62)	(7.94)	

** p< .05. ** p< .01 *** p< .001. ADM = anti-depressant medication. LOT = Life Orientation Test. PASTAS = Physical Appearance State and Trait Anxiety Scale. S/EST = Self-esteem. S/EFF = Self-efficacy. SWLS = Satisfaction with Life Scale.*

Again, the direction of the means across the 4 of the SWB variables generating significant differences is remarkable because it is linear, demonstrating clear trends, as illustrated in Figures 5.7 to 5.10.

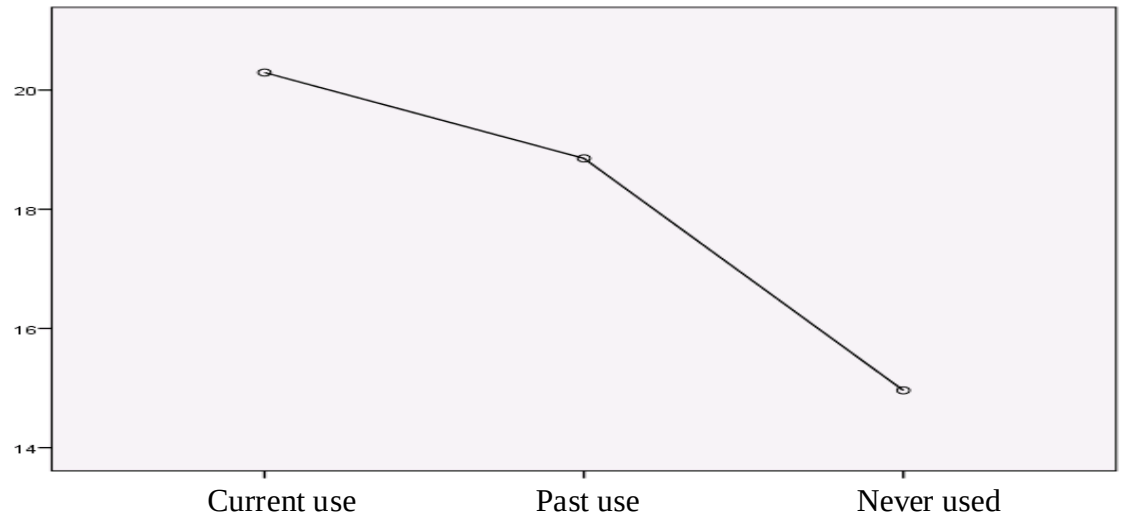


Figure 5.7: Mean scores for dispositional optimism across categories of anti-depressant use

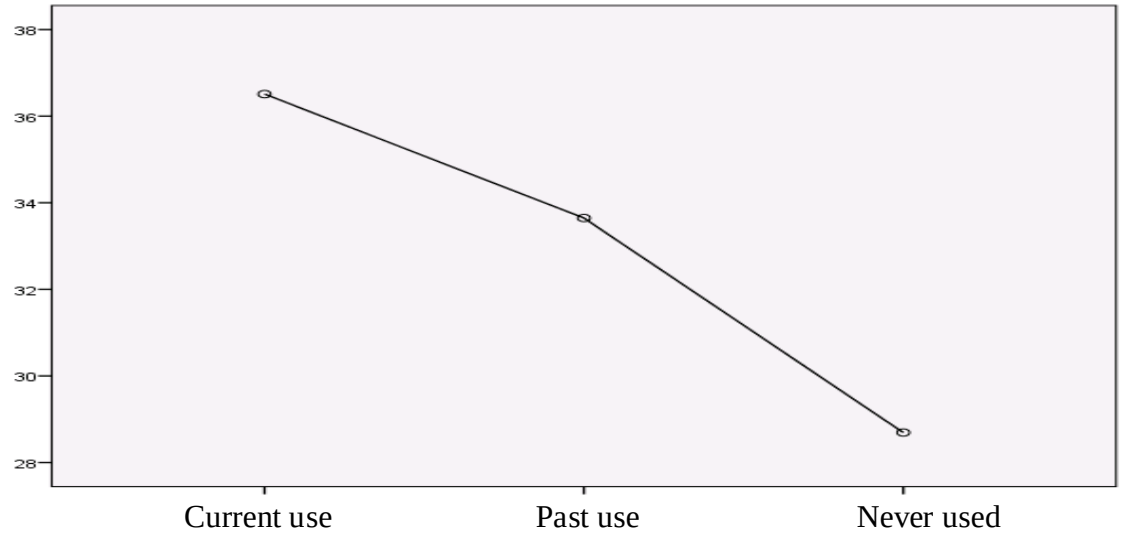


Figure 5.8: Mean scores for self-esteem across categories of anti-depressant use

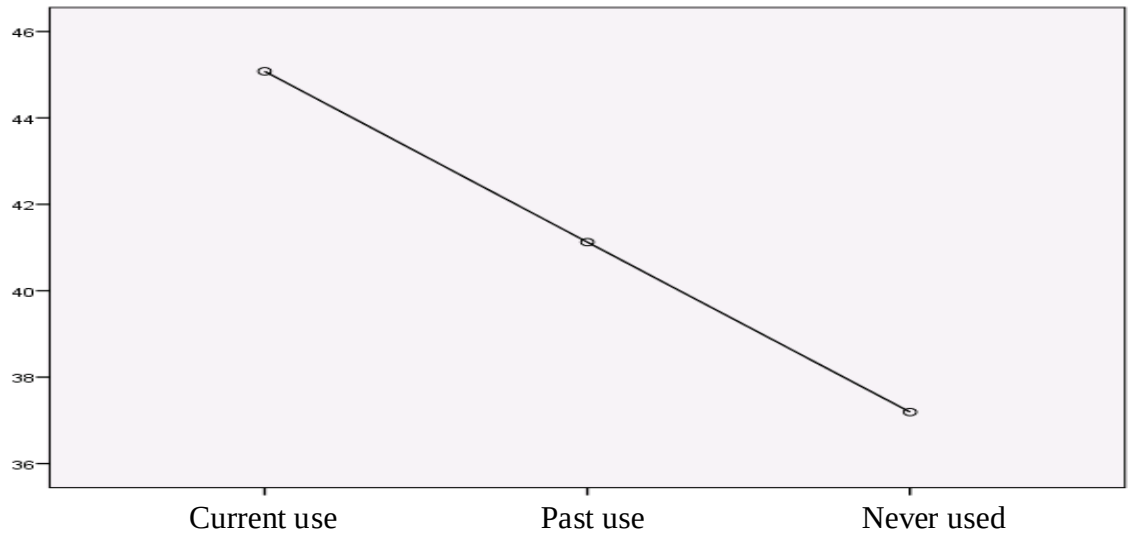


Figure 5.9: Mean scores for self-efficacy across categories of anti-depressant use

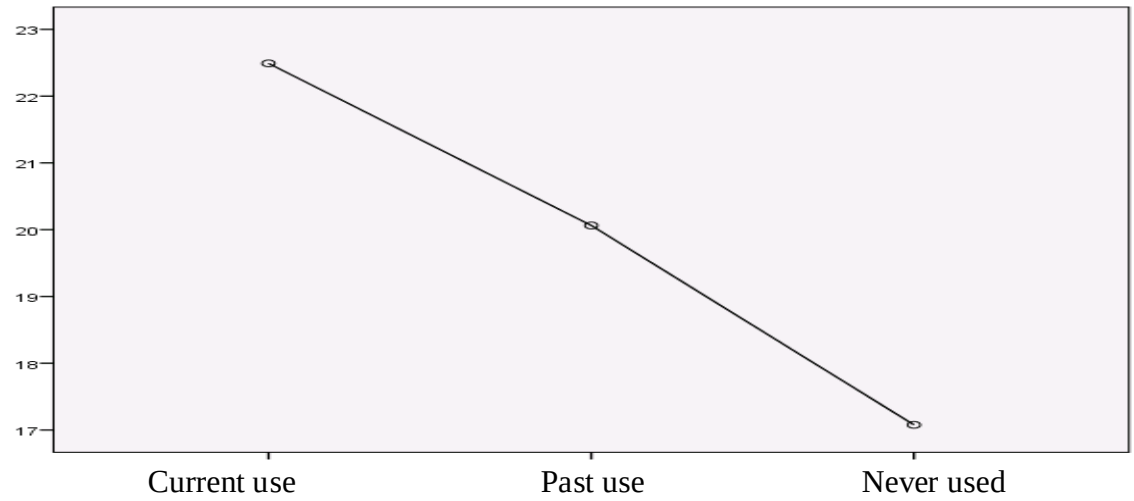


Figure 5.10: Mean scores for life satisfaction across categories of anti-depressant use

Physical appearance anxiety generated a different pattern of difference with those with past use of anti-depressant medication reporting the lowest anxiety (mean = 18.92), followed by those currently using anti-depressant medication (mean = 21.04), and the highest levels of anxiety being found in those who had never used anti-depressant medication (mean = 28.31), the difference was statistically significant ($p<0.01$). This is illustrated in Figure 5.11.

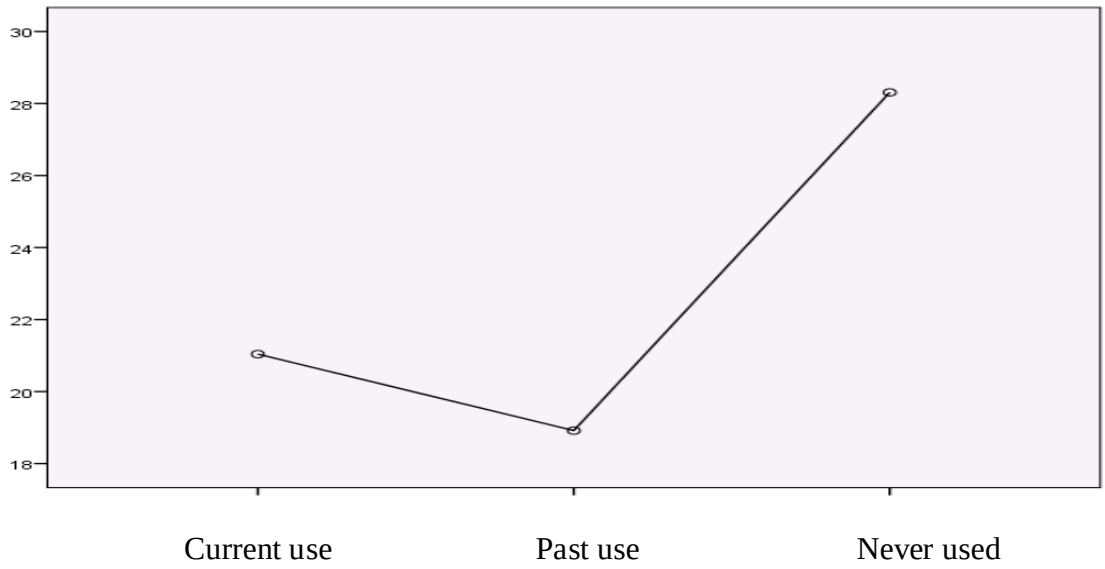


Figure 5.11: Mean scores for physical appearance anxiety across categories of anti-depressant use

The mainly linear relationship between correlates of SWB and use of anti-depressant medication is particularly interesting when considered in the light of previous findings in this thesis that suggest a pattern of behaviour whereby anti-depressant medication is ceased following surgery and then resumed after a period of time, usually 12 to 18 months. This could perhaps align with the period of low mood experienced during the period of post-surgical adjustment. The reported fluctuations in mood and perceptions of well-being may also influence the quality of personal relationships for the participants, as was highlighted by the married couple in study 7, so this is a further area of interest.

Personal relationships

As with any event that changes an individual's ability to care for themselves or fully engage in society, obesity surgery can have an impact on those closest to the patients. To establish the demographics of the cohort participants were asked about the status of their personal relationships. Eighty-three participants were married or in a civil partnership, 12 participants were single, 10 participants were co-habiting, 9 participants were separated, 7 participants were divorced and 4 participants were dating.

Twenty participants reported a change in their personal relationship status since having surgery. The most frequent change reported was going from being in a relationship to being single (9 respondents), followed by changing from one partner to a different partner (4 respondents) and changing from being single to being in a relationship (4 respondents). Three participants remained in the same relationship, but the quality of their relationship changed, as detailed below:

> *"We are much happier together"*
>
> *"More confident with my partner and allow him to see more of me"*
>
> *"I won't tolerate as much from my husband so think my increase in confidence levels has definitely made me re-evaluate my position within the home . . . and the outside"*

These changes in quality of personal relationships suggest that the participants are becoming empowered by the post-surgical psychological and physical changes.

Experience of hyperphagia (head hunger)

Participant experiences of post-surgical hyperphagia, where they felt an extreme unsatisfied need to consume food despite a lack of physical hunger or appetite, along with the knowledge that it could lead to physical discomfort, pain or vomiting, were reported in 93.6% of participants. Only 8 participants (6.4%) reported never experiencing hyperphagia, 72 participants (57.6%) reported experiencing it sometimes, 35 participants (28%) reported experiencing it most of the time, and 10 participants (8%) reported experiencing it all of the time. Furthermore, hyperphagia is positively associated with frequency of consuming large amounts of food ($r = 0.47$, $p<.01$), loss of control when eating ($r = 0.45$, $p<.01$) and frequency of binge eating ($r = 0.49$, $p<.01$). This clearly points to the dominance of the psychological drivers to consume food over the physical restraints for this obesity surgery cohort, and offers some support for the notion of food addiction.

Table 5.13 shows the group differences on personality factors between those who never experience hyperphagia, those who sometimes experience it, those who experience it most of the time, and those who experience it all of the time. Significant differences were found in relation to openness and agreeableness, but results should be interpreted with caution due to inconsistent group sizes.

In relation to openness, participants who reported experiencing hyperphagia most of the time had significantly lower openness when compared to the other 3 groups ($p<0.001$). In terms of agreeableness, those who experienced hyperphagia most of the time reported significantly lower agreeableness (mean = 40.20) than those who never experienced hyperphagia (mean = 46.50), but both mean scores are in the high parameters of the scale.

Table 5.13: Descriptive statistics and ANOVAs (one-way) for experience of hyperphagia on the big five self-report measures of personality

	Never (n=8) Mean (sd)	Some (n=72) Mean (sd)	Most (n=35) Mean (sd)	Always (n=10) Mean (sd)	F-test
O	38.5	36.61	32.23	38.10	5.53***
	(5.10)	(5.38)	(7.25)	(6.23)	
C	31.25	33.51	32.60	32.20	0.38
	(6.11)	(7.07)	(6.71)	(7.64)	
E	35.63	33.11	29.74	34.80	1.48
	(11.73)	(9.60)	(10.17)	(7.82)	
A	46.50	43.76	40.20	43.30	3.52*
	(2.88)	(5.87)	(7.50)	(5.96)	
N	26.36	30.46	33.06	33.50	1.69
	(9.35)	(9.18)	(8.17)	(8.54)	

** p< .05. ***p<.001. Some = sometimes. Most = most of the time. O = Openness. C = Conscientiousness. E = Extraversion. A = Agreeableness. N = Neuroticism*

Table 5.14 shows the group differences on correlates of SWB between prevalence of hyperphagia experienced. Although the group differences for dispositional optimism, self-esteem and self-efficacy were not statistically significant, there was a consistent trend whereby those who experienced hyperphagia all of the time reported less optimism, lower self-esteem and lower self-efficacy than those who never experienced hyperphagia.

Table 5.14: Descriptive statistics and ANOVAs (one-way) for experience of hyperphagia on five self-report correlates of subjective well-being

	Never (n=8) Mean (sd)	Some (n=72) Mean (sd)	Most (n=35) Mean (sd)	Always (n=10) Mean (sd)	F-test
LOT	20.38	19.03	18.26	15.70	1.56
	(6.07)	(5.46)	(4.42)	(5.06)	
PASTAS	23.13	18.79	25.26	29.50	4.74**
	(8.01)	(9.63)	(12.93)	(13.15)	
S/EST	34.88	35.15	31.37	31.50	2.33
	(7.26)	(7.66)	(7.51)	(7.25)	
S/EFF	45.25	45.58	40.63	39.00	1.75
	(7.27)	(7.47)	(5.88)	(8.03)	
SWLS	20.50	21.96	19.14	13.90	4.41**
	(7.96)	(6.82)	(6.90)	(8.21)	

** p< .05. ** p< .01 *** p< .001. LOT = Life Orientation Test. PASTAS = Physical Appearance State and Trait Anxiety Scale. S/EST = Self-esteem. S/EFF = Self-efficacy. SWLS = Satisfaction with Life Scale.*

A statistically significant difference was found in relation to physical appearance anxiety ($p<0.01$) with those who sometimes experienced hyperphagia (mean = 18.79) reporting less anxiety than those who experienced hyperphagia most of the time (mean = 25.26) or all or the time (mean = 29.50). There was also a statistically significant difference found for life satisfaction ($p<0.01$) with those who experienced hyperphagia all of the time reporting less life satisfaction (mean = 13.90) than those who experience it sometimes (mean = 21.96).

Post –surgical changes to health

Post-surgical changes to health reported by participants were largely positive, with only 9 participants (5.3%) reporting a worsening of health, 19 participants (11.2%) reporting no change in health, and 88 participants (70.4%) reporting improved health. Participants also had the opportunity to describe their changes in health and 89 of the 125 participants chose to do so. The most frequently described health change was an overall improvement in physical health (74 respondents), rather than simply weight loss, as is demonstrated in the following quote:

> *"Prior to the Duodenal Switch I had chronic pain syndrome and used a wheelchair. Although I have osteo-arthritis I no longer even use a stick. Type 2 diabetes has resolved as has hypertension and asthma. I no longer have stress incontinence, poor skin and breathlessness. The number of headaches I have, have reduced significantly. My health profile has been transformed by weight-loss surgery."*

An in-depth analysis of the descriptive data relating to positive physical health changes found five key themes: increased mobility (45 responses), reduced pain (32 responses), reduced blood pressure (26 responses), diabetes resolved (18 responses) and sleep apnoea improved (13 responses). These themes support the previous literature detailing individual physical health improvements following obesity surgery, but also add to the existing knowledge because a holistic approach was taken that focuses on the individual as a whole, rather than on symptoms of a specific illness or condition.

In contrast, only 13 participants reported negative changes to physical health, but again these seemed to represent an overall negative impact, rather than simply a disappointment in weight loss or an increase in symptoms relating to a specific illness, as is demonstrated by the following quote:

> *"Loss of muscle tone and muscle mass. Constant faecal incontinence. Constant abdominal pain."*

Pain, particularly in the abdomen, was the most frequently reported negative change to physical health (8 responses), followed by faecal constipation or incontinence (4 responses), surgical complications (3 responses) and potassium or iron deficiencies (3 responses). In addition, negative changes included *"exhaustion*", *"weight re-gain*", *"worsened arthritis*", *"worsened mobility*" and *"migraine*". These negative physical outcomes are largely unreported in the literature.

There were 15 responses describing changes to mental health and these were mainly positive changes (12 responses), many of which related to alleviation of depression (8 responses). Other positive changes included generic descriptions such as *"mentally better"* and *"already feel a bit more confident".* Some participants reported a fluctuation in mental health in a similar pattern to the findings of the previous qualitative study, and these represented most of the negative psychological outcomes reported. This pattern is demonstrated in the following quote:

> *"Not needed anti-depressants for almost a year, back on them again as I seem to need them again."*

There was only one participant who deviated from this pattern and she clearly had many complications including a co-morbidity of bulimia nervosa. She experienced both psychological and physical complications. The outcomes of her bulimia could be related to her surgical complications. Her quote clearly demonstrates a need for input from psychological services in addition to the post-surgical weight-management clinic.

> *"I had major complications and have had 30 operations to put everything back to working order. I have also relapsed with my bulimia and hate the way I look and feel. People tell me I am normal but I still feel I am 22 stone even when I was at my lowest of 8 stone. I have regained 4 stone in the past year and hate myself for it."*

Reported health outcomes from this data overwhelmingly support the findings from previous literature and from the previous qualitative study, however this data is unique because it takes an ideographic holistic approach rather than relying on predetermined questions about a specific health outcome. This allows for a narrative to capture the interrelationships between the various health issues. The biggest and most robust change identified is in relation to physical health; with improvements felt across the domain for the majority of participants. This is associated with positive psychological outcomes, and the previous finding of a pattern whereby mood improves post-surgery but then returns to the previous position.

Post –surgical changes to quality of life

Post-surgical changes to quality of life reported by participants were largely positive, with only 7 participants (5.6%) reporting a worsening of quality of life, 11 participants (8.8%) reporting no change in quality of life, and 96 participants (78.8%) reporting improved quality of life. Participants also had the opportunity to describe their changes in quality of life, and 95 of the 125 participants chose to do so. Reported changes in quality of life encompassed both psychological (62 comments relating to positive psychological change; 3 comments relating to negative psychological change) and physical change (58 comments relating to positive physical change; 6 comments relating to negative physical change).

The most frequently described psychological quality of life change was increased happiness (17 respondents) and confidence (38 respondents) due to feeling an accepted part of society (42 respondents), as is demonstrated in the following quotes:

> *"I feel like I'm not being stared at any more because I'm fat therefore that makes me happier and a more confident person"*
>
> *"I am more confident and outgoing. More willing to go to places and socialise whereas before I would hide away at home"*
>
> *"I feel that I no longer stand out in a group of people as being the fattest person there, and in fact now I really like the way I look, so I take more care when choosing clothes, wear make-up more often and also wear perfume, whereas I didn't before in case it drew attention to me"*

Many of the quality of life comments reveal the hidden fears experienced by obese people relating to everyday tasks in a world devised for average sized people:

> *"I feel much more confident, I am more outgoing, and more happy with my self image. It has had (sic) a real difference in what I feel I*

can now do. In the past nine months I have done things without the fear of possibly breaking a chair if I sit in it, or not being able to fit in a seat belt"

Further comments relate to feeling accepted within society and being *"able to do things most 'normal' people do"* and *"now being able to lead a normal life"*, along with no longer feeling judged because of size:

"Life is full of small secret celebrations (I can sit in café chairs with arms, I crossed my legs without even realising, the airline table went all the way down …etc.) My career life is also improved – less of the subtle (or not so subtle) discrimination"

"I feel much more able to engage with others, less isolated, increased confidence, I feel less judged, improved self-esteem, I like myself"

"I feel I am no longer a one woman freak show"

Post-surgical changes to quality of life linked to physical improvements also involved being *"normal",* and fitting into society:

"Changed in every way possible. I couldn't tie my own shoes, now I can go hiking for miles!"

"Able to walk and get about more easily and also enjoy any type of seating i.e in restaurants, theatres and so on"

"I have a life, I can go out wherever I want, I can do anything I wish to and wear what I want without worrying about my size"

"I can do anything I want to. No longer need to think about my size/health stopping me"

However, some participants reported a reduction in psychological health, perhaps associated with the pressures of becoming more integrated in society, as depicted in the following comment:

"Feel a total failure now, anxious and anti-social"

There were a few comments depicting negative changes to quality of life, some of which tended to be related to pre-existing co-morbidities such as osteoarthritis or bulimia, and the disappointment felt by the participants perhaps relates more to their unrealistic expectations of surgery to solve all of their medical problems. The following comment is from a participant who reported that their quality of life worsened following surgery, but it is clear from the quote that the reduction in quality of life was due to a pre-existing condition, not the surgery:

> *"My mobility hasn't improved because after using the gym for 3 months I was diagnosed with severe osteoarthritis in my knees and need a knee replacement within 18months"*

Moreover, the following quote demonstrates that the participant feels like a 'victim' of surgery and reports feeling out of control, with clear psychological problems that surgery cannot address:

> *"I have chronic pain and fatigue along with depression, now have to have morphine and anti-depressants daily. I am sick daily from bulimia or from the effects of the medications I now take. I feel totally out of control and hate the surgeon who has done this to me"*

Some of the negative quality of life comments were connected to physical changes following surgery, such as *"Not being able to eat"*, fatigue or pain:

> *"Unable to maintain body temperature, always feel cold. Confusion, lack of concentration, loss of language skills, poor memory function, always tired"*

> *"When I am in pain I cannot frequently care for myself, I cannot work full time and am housebound quite a lot"*

In sum, the changes to quality of life have been overwhelmingly positive and reach well beyond the benefits of being physically fitter. Improvements to quality of life link to being a part of society and are summed up in the following comment:

> *"I now have a life, I feel a valuable part of society and no longer feel the need to apologise for existing"*

Discussion

The aim of this study to establish norms of SWB correlates in a severely obese surgical treatment population in a non-clinical setting was met. The measures proved reliable with scores largely as expected, indicating a cohort with moderate openness, conscientiousness and extraversion, and higher than average agreeableness and neuroticism, suggesting a cohort with a desire for friendships and acceptance along with some insecurity. This is echoed in the quality of life comments, where participants overwhelmingly stated that feeling part of society was a large indicator of quality of life. The SWB profile of the cohort was mainly as predicted, demonstrating a broadly pessimistic outlook on life, along with moderate levels of self-esteem, self-efficacy and life-satisfaction. However, physical appearance anxiety was generally lower than expected for an obese sample which could perhaps be explained by their weight-loss. Although the participants were mainly overweight or obese, the majority were significantly less obese than prior to surgery, so their experience of being obese relative to pre-surgery would be positive, thus resulting in lower than expected physical appearance anxiety.

There were moderate to strong relationships found between the correlates of subjective well-being, and these relationships were in the directions predicted, providing further evidence of a good fit for the measures. Moreover, path analysis revealed that the personality factors extraversion, conscientiousness and neuroticism combined with self-esteem and dispositional optimism to explain 32% of the variance in life-satisfaction, and combined with self-efficacy and dispositional optimism to explain 68% of the variance in self-esteem. This adds to the existing knowledge by providing further support for the role of the personality factors extraversion, conscientiousness and neuroticism in discriminating between high and low well-being (Grant et al., 2009; Bukovic et al., 2012), and extending

this knowledge by illustrating the mechanism by which these factors impact on well-being in an obese sample.

The weight profile of the cohort conforms with NICE guidelines in that the laparoscopic adjustable gastric band patients had a significantly lower pre-surgical weight (mean = 126.16kg) than both the laparoscopic gastric bypass patients (mean = 150.50kg) and the duodenal switch patients (mean = 154.62kg), and as predicted, reported the least problematic profile in terms of correlates of subjective well-being.

Given that obesity surgery patients often have unrealistic expectations about the outcomes of surgery (Price et al., 2013), levels of satisfaction with the surgical outcomes were optimistic in this cohort with 101 satisfied participants compared to only 13 unsatisfied participants. Participants who were less satisfied with surgery reported significantly higher physical appearance anxiety and were more likely to regularly binge eat than those who were more satisfied with surgery, suggesting that the dissatisfaction with surgery could be due to outcomes being compromised by bingeing leading to continued appearance anxiety rather than the surgery per se. When considering satisfaction with type of obesity surgery, the participants who had the more complex surgery involving mal-absorption in addition to restriction were most satisfied, and this could be due to this form of surgery typically leading to faster weight-loss than the other forms of surgery, while allowing the patient to continue to consume large quantities of food. This complex form of obesity surgery which includes mal-absorption is considered more risky than the less invasive forms because it is also associated with greater side effects (e.g. faecal incontinence, reduced bone density, hair-loss and vitamin deficiency) but these issues seems to have been discounted by the majority of participants in the current study, in favour of the benefits of faster weight-loss

and the continued ability to consume the desired food. This makes an original contribution to the knowledge by demonstrating that patients are prepared to accept higher health risks associated with surgery outcomes in return for faster weight-loss and an ability to continue to eat inappropriately, further contradicting the previous findings of Brantley et al. (2014) who claimed that participants elected for obesity surgery for health reasons.

The cohort was largely stable in terms of personal relationships; with only 20 respondents (16% of cohort) reporting a change in their relationship status since surgery. Moreover, the positive changes in quality of personal relationships suggest that the participants are becoming empowered by the post-surgical psychological and physical changes, which are exerting a beneficial influence on personal relationships. However, as many obesity surgery candidates are reliant on close partners for personal care prior to surgery (washing, dressing, etc.), these changes in personal interaction may require an associated change in others to accommodate the newfound personal confidence and independence, a factor that could be raised prior to surgery to prepare partners and carers for the changes.

Inappropriate eating behaviours in the obese have been linked to depression (Fabricatore et al., 2006) and perceived stress (Sims et al., 2008), so the relationship between correlates of subjective well-being and hyperphagia and binge eating were important factors in the current research. Prevalence of post-surgical hyperphagia in this study was 93.6% of the research participant cohort, with only 8 participants (6.4% of cohort) never experiencing it, which is much higher than the 'high prevalence' found by Facchiano, et al., (2013). High frequency of hyperphagia (experience it most of the time) was associated with poor subjective well-being across the correlates. Furthermore,

hyperphagia was positively associated with all aspects of binge eating. This clearly points to the dominance of the psychological drivers to consume food over the physical restraints for this obesity surgery cohort and offers some support for the notion of food addiction previously posed (Christodoulou, 2010; Davis & Carter, 2009). This suggests that the attention given to changing physical exercise behaviour in obesity surgery populations (Hunt & Gross, 2009; Livhits et al., 2010; Stroops, & Alexander, 2011) should be extended to diet behaviour, as surgery may physically reduce consumption for a short period of time, but it does not remove the psychological drivers to eat.

In terms of establishing the prevalence of eating disorder symptoms in the current cohort using the EDE-Q (Fairburn, & Beglin, 1994), it was found that most participants engaged in binge eating behaviours to some degree, supporting the previous findings of Macias and Leal (2002), but approximately one third of participants met the clinical diagnostic criteria for bingeing, while purging was rare. Approximately one fifth of participants met the clinical diagnostic criteria for shape concern (eating in secret, feeling guilty when eating and being fearful of being seen eating), and between one third and a half of participants met the clinical diagnostic criteria for weight concern (items relating to self-disgust, dissatisfaction and discomfort with ones weight and body). Taking all three sub-scales into consideration, approximately one fifth of participants met all criteria for binge eating disorder, matching the prevalence found by Diaz et al., (2012). In terms of the relationship between binge eating and correlates of SWB, the current study makes an original contribution to knowledge by demonstrating that the EDE-Q subscale shape concern is most strongly associated with correlates of SWB, with those who eat in secret, feel guilty about eating and who are fearful about being seen eating reporting the poorest

SWB. This is perhaps connected to obesity stigma and the experience of being part of a marginalised group in society.

Depression is known to be a risk factor in the obese (Wadden & Sarner, 2006; de Wit et al, 2010; Luppino et al, 2010; Kyron et al, 2011) and in the current study use of anti-depressant medication was used as a proxy to assess prevalence of depression. As predicted, prevalence of anti-depressant use was found to be significantly higher in this cohort than in the general population. There were 51 current anti-depressant users (40.8% of cohort), 48 past users (38.4% of cohort) and only 26 non-users (20.8% of cohort). Population data shows that the frequency of anti-depressant prescription in the Primary Care Trust with the greatest anti-depressant usage (Blackpool PCT) was 18.87% of the population, and only 4.3% of the population in Brent Teaching PCT, the Primary Care Trust with the lowest anti-depressant usage (Easton, 2013). Therefore the proportion of anti-depressant users in the research cohort was more than double that of the heaviest general population use. This further adds to the literature on obesity surgery outcomes and points to the need for addressing psychological factors alongside surgical procedure for optimal benefits.

As shown in Tables 5.11 and 5.12, anti-depressant medication appears to have a positive effect on correlates of SWB, with those currently using anti-depressant medication reporting significantly higher dispositional optimism, self-esteem, self-efficacy, life satisfaction, openness, conscientiousness and extraversion, and lower neuroticism than participants who have never used anti-depressant medication. This makes a key contribution to knowledge by suggesting that those who use anti-depressant medications may have a personality profile that is more open to accepting and tackling health complications, so may be more likely to exploit the gains made from obesity surgery. This could have implications

for clinical practice as current psychological screening may take the view that use of anti-depressant medication is an indicator of a psychological profile that would struggle to adapt to the necessary changes brought about by obesity surgery, whereas these finding suggest the opposite.

Post-surgical changes to health in this cohort were mainly positive, with only 9 participants (5.3%) experiencing a worsening of health and 88 participants (70.4%) reporting improved health, supporting the findings of earlier literature (Fontaine et al., 2004). The most frequently described health change was an overall improvement in physical health, rather than weight loss alone. The most frequently cited improvements relate to common outcomes of sustained obesity; mobility (Alley & Chang, 2007), pain (Vuolteenaho et al., 2013), blood pressure (van Gaal et al., 2006), diabetes (Lazar, 2005), and sleep apnoea (Hewitt et al., 2014), all of which may impact on life satisfaction and other correlates of subjective well-being. There were some negative changes to physical health reported but these tended to be related to the surgery rather than obesity per se, and were mainly concerning abdominal pain, constipation and malnutrition. In addition, positive changes to mental health were reported, specifically in relation to alleviation of depression. The improvements in general health are associated with positive psychological outcomes, and the previous finding within this thesis of a pattern whereby mood improves post-surgery but then returns to the previous position. This makes an original contribution to knowledge and suggests that post-surgical medical and pastoral care should take account of these changes over time.

Post-surgical changes to quality of life were also largely positive, with only 7 participants (5.6%) reporting a worsening of quality of life, and 96 participants (76.8%)

reporting improved quality of life. The most frequently described changes in quality of life related to becoming an accepted part of society, and no longer feeling judged by others. This is evidence of the well-established discrimination and stigmatisation associated with obesity (Azevedo et al., 2013). Participants often refer to being 'house bound' prior to surgery, but it is clear from the comments that this self-imposed withdrawal from society has as much to do with the frequent humiliations experienced from not being able to fit in a world devised for average sized people (e.g. sit on chairs without them breaking), as it has to do with poor mobility. Less positive changes to quality of life were often associated with pre-existing co-morbidities, and the disappointment felt by the participants in surgery not resolving all of their medical problems may be linked to a tendency for unrealistic expectations, as suggested by Price et al. (2013). Therefore, the limitations of the surgery should be made clear to the patient before the decision to undergo surgery is made.

This study has clear strengths in that it adds to the current literature by providing a comprehensive descriptor of a broad obesity surgery cohort from across the UK, and includes both NHS and privately funded participants. It is also useful in that it taps into the psychological elements that can help or hinder overall success following obesity surgery. However, a clear limitation of the study is that it is cross sectional and provides data at only one point in time. A longitudinal study that replicated the process at intervals would provide greater insight into the direction of the relationships between correlates of SWB and obesity factors. For example, satisfaction with surgical outcomes has a strong negative association with the binge element of the EDE-Q sub-scale 'eating concern', but it is not known whether this is because participants are continuing to binge and so are not shedding weight as quickly as anticipated leading to dissatisfaction with the outcomes of surgery, or whether

it is because participants have a strong desire to binge but cannot because of the physical restrictions of surgery, so are dissatisfied with the outcomes of surgery.

Dissemination

The findings from this study were presented to the user-group Weight-Loss Surgery Information Services (WLSINFO.org.uk) at their Annual Conference in Liverpool, in February 2009 (keynote speaker).This was followed by a question and answers session and ensured that the findings were understood by the user group. The findings were also presented to an academic audience in poster format at the BPS Annual Conference, Brighton, in April 2009.

Chapter 6

Obesity and subjective well-being across the populations

The previous chapter provided evidence that obesity surgery candidates had a long history of dieting and weight cycling which supports previous research findings (Gibbons et al., 2006) and suggests that, contrary to popular opinion, obesity surgery candidates make repeated efforts to control their weight, but are unsuccessful. This chapter brings together two cohorts of females; the 18-19 year old student group who are at the beginning of the weight-control journey, many of whom have already begun the dieting/non-dieting lifestyle, and the obesity surgery group who have long experience of the dieting/non-dieting lifestyle and are at the later stages of the weight control journey.

The aim of this chapter is to examine the personality factors and correlates of SWB across the 2 cohorts to identify areas of similarity and difference. It is predicted that personality factors will be similar across the groups, but that the obesity surgery group will have lower levels of life satisfaction because of the discrimination and stigma experienced due to being severely obese (Azevedo et al., 2013). Bockerman et al., (2013) suggested that the relationship between SWB and obesity stigma is dependent on the cultural context, with those in socio-economic groups where it is more acceptable experiencing less stigma. Applying this ethos to the 2 groups, it is predicted that the surgery group will experience less stigma despite being more obese, due to the context of the obesity surgery support group where obesity is considered the norm, than the student group, due to being part of an adolescent group where obesity is considered to be less acceptable (Farhat et al., 2010).

STUDY 10

Comparative weight-loss cohort study

The research aims of this study are to identify areas of similarity and difference between a group of actively dieting female students (*n*=118) and a group of female obesity surgery candidates (*n*=116). The variables of interest are personality factors and correlates of SWB, along with experience of hyperphagia and use of anti-depressant medication.

It is predicted that personality factors will be similar across the groups because this is suggested by the findings of chapters three and five (see Tables 3.5 and 5.2), and there may be some similarities across correlates of SWB because both groups are actively dieting. However, it is expected that the obesity surgery group will have lower levels of life satisfaction, the direct measure of the cognitive element of SWB, because of long-term discrimination experienced due to being severely obese. It is also predicted that, simply because of their weight, the obesity surgery group will report higher levels of physical appearance anxiety than the student group. In terms of hyperphagia, it is expected that this will be more prevalent in the obesity surgery group because they have experience of many dieting attempts, the failure of which could be associated with feelings of deprivation and subsequent hyperphagia. It is also predicted that the obesity surgery group will report a higher prevalence of anti-depressant medication use because of the findings from study 9 (see Table 5.11) along with the well-reported associations between depression and obesity.

Method

Participants

An opportunity sample of women with a history of dieting (N = 234) was included in this study. They had all taken part in the previous studies and the sample comprised 118 undergraduate students and 116 obesity surgery candidates. The student group was younger than the obesity surgery group (ages 18-19 and 35-55 respectively), and there were differences in self-reported height and weight. The 2 groups were almost identical in terms of height, but the obesity surgery group was significantly heavier than the student group, both at heaviest and current weight, and there was a corresponding difference in BMI, as shown in Table 6.1. Because both groups are actively trying to shed weight, the current weight and BMI are lower than the heaviest weight and BMI in both groups, but the difference between the 2 groups is less in the current status than in the heaviest status because the obesity surgery group are shedding the excess weight at a much faster rate than the student group.

Table 6.1: Participant self-reported height and weight

Descriptor	Group	Range of Scores	Mean	sd
Height in Metres	Student	1.27 - 2.00	1.66	0.09
	Surgery	1.52 - 1.80	1.65	0.06
Heaviest Weight (Kg)	Student	50.00 - 180.00	71.32	17.41
	Surgery	90.70 - 218.00	139.61	28.64
Current Weight (Kg)	Student	46.00 – 175.00	64.98	15.81
	Surgery	49.00 – 198.00	98.76	27.92
Heaviest BMI	Student	14.17 – 55.56	25.70	6.05
	Surgery	35.29 – 86.02	51.62	10.55
Current BMI	Student	14.07 – 54.07	23.51	5.30
	Surgery	18.00 – 36.56	36.56	10.55

Design

This is a cross-sectional quantitative study comparing correlates of subjective well-being across 2 cohorts; a young student cohort at the beginning of the dieting journey, and an older cohort with significant weight cycling history. The independent variables are the demographic group factors and the dependent variables are the correlates of subjective well-being.

Materials

A booklet of measures was used to assess correlates of SWB and appearance anxiety, along with some demographic questions. The validated measures used were the same as in the previous studies, namely the *Life Orientation Test - Revised* (Carver & Scheier, 1985), the *Satisfaction with Life Scale* (Diener et al., 1985), the *Physical Appearance State and Trait Anxiety Scale* (Reed et al., 1991), Extraversion and Neuroticism from *Five factor Model* (Costa & McCrae, 1985), *Self-esteem* (Rosenberg, 1965) and *Self-efficacy* (Schwarzer, & Jerusalem, 1995). The demographic questions included past and present use of anti-depressant medication and experience of hyperphagia.

Procedure

As with the previous study, the measures were collated into an electronic booklet and data was collected online using Bristol Online Surveys (BOS). The link to the booklet was posted on the WLSInfo.org forum and on the LJMU intranet, to allow both cohorts to participate. The weight-loss surgery participants took part because they were interested in the subject matter, and students participated in return for module credits on their degree programme. The data was held by BOS, and downloaded by the researcher.

Ethical considerations

Ethical approval for this study was granted by the Liverpool John Moores University Ethics Committee and permission to recruit from the WLSInfo.org website was granted by Mr Ken Clare, the group founder. Ethical issues related to the

sensitivity of some of the questions, but these had been used on previous studies without any ethical issues arising.

Results

Descriptive statistics

The descriptive statistics shown in Table 6.2 demonstrate that, with the exception of agreeableness (Kurtosis = 2.15), the data can be considered normally distributed with the full range of scores being used. Moreover, according to Lei and Lomax (2009), values above 1 only represent a slight depart from normality and are only a problem if they exceed 2.5, although Kline (2005) sets this value at 3, so the current data can be considered to be normally distributed.

Table 6.2: Descriptive statistics for the six self-report measures (combined cohort)

	Mean	SD	Mid-Point of Scale	Range of Scores	Skew	Kurt
LOT	19.02	5.06	20	6-26	-0.24	-0.73
SWLS	22.73	6.55	20	5-35	-0.68	-0.04
PASTAS	20.05	11.26	32	0-64	-0.72	0.82
S/EST	34.67	7.25	30	11-50	-0.59	0.55
S/EFF	41.99	6.98	36	19-60	-0.27	0.42
O	35.82	6.27	25	16-50	-0.23	-0.24
C	34.12	7.28	25	14-50	-0.17	-0.35
E	34.04	9.07	25	10-50	-0.41	-0.28
A	42.91	5.98	25	19-50	-1.29	2.18
N	29.62	8.86	25	10-50	-0.05	-0.48

LOT = Life Orientation Test. SWLS = Satisfaction with Life Scale. PASTAS = Physical Appearance State and Trait Anxiety Scale. S/EST = Self-Esteem. S/EFF = Self-Efficacy. O = Openness. C = Conscientiousness. E = Extraversion. A = Agreeableness. N = Neuroticism. Skew = Skewness. Kurt = Kurtosis.

The mean scores for both dispositional optimism (19.02) and life satisfaction (22.73) were nestled around the mid-point of the scale (20). The mean score for physical

appearance anxiety (20.05) was low, while the mean score for both self-esteem (34.67) and self-efficacy (41.99) was high, suggesting a psychologically healthy cohort. The means and standard deviations for the five factors of personality were as expected as they conformed to previous findings in this research, as seen for example in Table 5.2.

Comparative statistics

Scores for the five personality factors were compared between the student group and the obesity surgery group, and results are illustrated in Table 6.3.

Table 6.3: T-test results for the for the five factors of personality by group

Measure	Group	Mean	sd	t
O	Student	36.25	6.08	1.07
	Surgery	35.38	6.46	
C	Student	34.92	7.55	1.71
	Surgery	33.30	6.93	
E	Student	35.52	7.80	2.54*
	Surgery	23.53	10.02	
A	Student	42.69	5.91	-0.58
	Surgery	43.14	6.06	
N	Student	28.26	8.47	-2.38*
	Surgery	30.99	9.07	

**p<.05. O = Openness, C = Conscientiousness, E = Extraversion, A = Agreeableness, N = Neuroticism.*

Mean scores for the three of the five personality factors were found to be similar for both groups, with moderately high openness (36.25, 35.35) and conscientiousness (34.92, 33.30), and very high agreeableness (42.69, 43.14). However, the student group reported significantly greater extraversion (35.52) and lower neuroticism (28.26) than the surgery group (23.53, 30.99, $p<0.05$), suggesting that the younger student cohort was more outgoing and emotionally stable than the older obesity surgery cohort. Results

reported at the $p<0.05$ level should be interpreted with caution to allow for the possibility of Type I errors. However, Levene's test demonstrated no problems with equality of variances ($p>0.05$), with the exception of extraversion ($p<0.05$) where this is violated, but the correction was applied and the more moderate result reported.

Table 6.4: T-test results for the for the correlates of subjective well-being by group

Measure	Group	Mean	sd	t
LOT	Student	19.28	4.70	0.79
	Surgery	18.76	5.31	
SWLS	Student	24.57	5.26	4.50***
	Surgery	20.85	7.20	
PASTAS	Student	18.06	10.65	-2.77*
	Surgery	22.08	11.55	
S/EST	Student	35.31	6.66	1.37
	Surgery	34.02	7.78	
S/EFF	Student	42.11	6.94	0.26
	Surgery	41.87	7.04	

**p<.05, ***p<.001. LOT = Life Orientation Test, SWLS = Satisfaction with Life Scale, PASTAS = Physical Appearance State and Trait Anxiety Scale, S/EST = Self-Esteem, S/EFF = Self-Efficacy.*

In terms of group comparisons for the correlates of subjective well-being, Table 6.4 shows that mean scores for dispositional optimism (19.28, 18.76), self-esteem (35.31, 34.01) and self-efficacy (42.11, 41.87) were similarly moderate for both groups.

However, the student group reported significantly greater life satisfaction (24.57) than the surgery group (20.85), $p<0.001$, and lower physical appearance anxiety (18.06) than the surgery group (22.08), $p<0.05$, suggesting that the younger student cohort was more satisfied with life and less anxious about their appearance than the older obesity surgery cohort. Levene's test demonstrated no problems with equality of variances ($p>0.05$), with the exception of life satisfaction ($p<0.05$) where equal variances are not assumed, but the correction was applied and the more moderate result reported.

Hyperphagia

Participants were asked about the frequency of experiencing 'head hunger' or hyperphagia *when dieting*, described as obsessive thoughts about food along with an unsatisfied desire to consume food, even to the point of pain or vomiting. Results shown in Table 6.5 suggest some similarities across the 2 groups, with experiencing hyperphagia 'sometimes' being the most frequently reported response for both the student group (57 responses) and the obesity surgery group (67 responses). However, the rank orders of scores then went in opposing directions, with the next highest frequency of response for the student group being 'never', (33 responses), while it was 'most of the time' (33 responses) for the obesity surgery group, suggesting that hyperphagia was more prevalent in the latter group. An independent measures t-test confirms that the difference was statistically significant ($p<0.001$), and it should be noted that sample sizes were almost equal (n=116, n=118).

Table 6.5: Frequencies and t-test result for experience of hyperphagia

Descriptor	Student Group	R	Surgery Group	R	t-test
Never	33	2	7	4	3.55***
Sometimes	57	1	67	1	
Most of the time	21	3	33	2	
All of the time	7	4	9	3	
Mean (sd)	2.02 (0.84)		2.38 (0.72)		

*R = Rank order of scores. *** = p<0.001*

Hyperphagia when dieting could sabotage attempts to adhere to a calorie controlled diet, and could be implicated in the history of weight cycling found in the

obesity surgery group, for whom the prevalence was higher. The impact of experience of hyperphagia on the five personality factors was then examined across the entire cohort using a one way ANOVA, to explore personality differences between those who experience hyperphagia frequently and those who do not. Results are reported in Table 6.6, and it should be noted that homogeneity of variance was satisfied across all paired tests (p>0.05).

Table 6.6: One way ANOVA for impact of hyperphagia on five personality factors, across entire cohort (N=234)

Factor	Never (n = 40)	Sometimes (n = 124)	Most times (n = 54)	Always (n = 16)	F
O	36.25 (6.64)	36.60 (5.48)	32.61 (6.69)	39.56 (5.90)	7.56***
C	35.70 (7.08)	34.47 (7.14)	32.91 (7.04)	31.56 (8.89)	0.13
E	36.93 (9.06)	34.20 (8.64)	31.31 (9.85)	34.75 (7.74)	0.03
A	42.93 (5.66)	43.47 (5.83)	41.44 (6.23)	43.50 (6.65)	0.21
N	28.58 (9.13)	29.63 (8.44)	30.22 (9.62)	30.06 (9.36)	0.84

P<.001. O = Openness, C = Conscientiousness, E = Extraversion, A = Agreeableness, N = Neuroticism.

The only statistically significant difference between groups found was in relation to openness. Post-hoc tests revealed that those who experienced hyperphagia 'most of the time' reported significantly lower openness than the rest of the participants (p<0.05). This is illustrated in Figure 6.1.

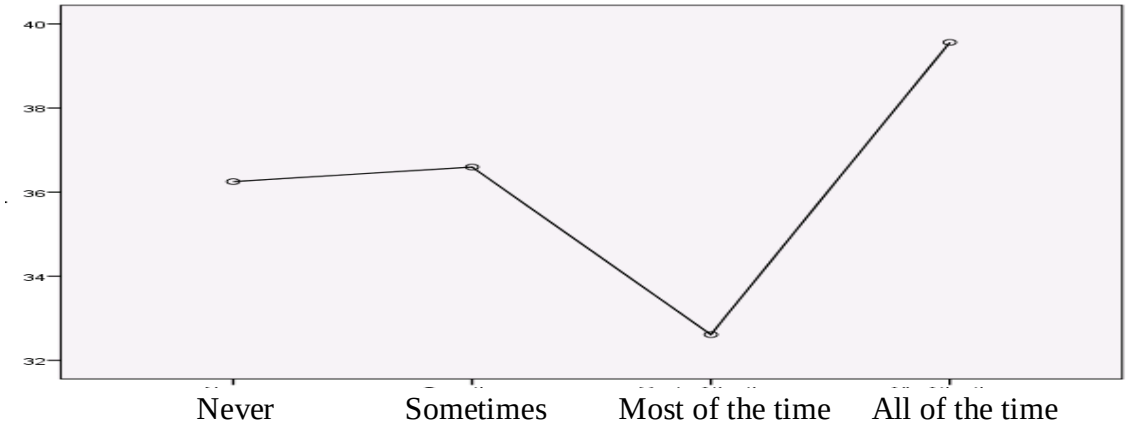


Figure 6.1: Mean scores for openness across categories of hyperphagia

Although the group differences for conscientiousness are statistically non-significant, they are interesting because they follow a linear pattern, with those who never experience hyperphagia reporting the highest conscientiousness (35.70) and those who experience hyperphagia all of the time reporting the lowest level of conscientiousness (31.56). This is illustrated in figure 6.2.

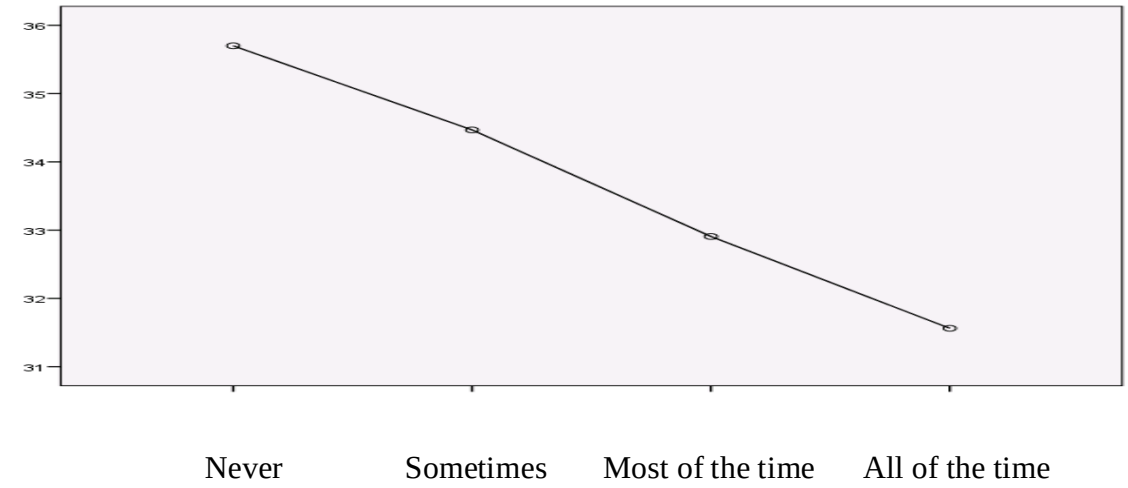


Figure 6.2: Mean scores for conscientiousness across categories of hyperphagia

The procedure was replicated to examine the impact of experience of hyperphagia on correlates of subjective well-being. Results are reported in Table 6.7.

Table 6.7: One way ANOVA for experience of hyperphagia and correlates of SWB

Measure	Never (n = 40)	Sometimes (n = 124)	Most times (n = 54)	Always (n = 16)	F
LOT	19.95 (4.81)	19.56 (5.16)	18.02 (4.72)	15.94 (4.60)	3.73**
SWLS	25.38 (4.79)	23.46 (6.29)	20.31 (6.38)	18.56 (8.71)	7.94***
PASTAS	16.10 (9.67)	18.48 (10.57)	24.54 (11.65)	26.94 (12.04)	7.95***
S/EST	37.00 (5.89)	35.41 (7.27)	31.56 (7.19)	33.63 (7.48)	5.55**
S/EFF	42.78 (7.51)	42.79 (7.17)	40.09 (5.69)	40.25 (7.07)	2.42

***p<.01, **p<.001. LOT = Life Orientation Test, SWLS = Satisfaction with Life Scale, PASTAS = Physical Appearance State and Trait Anxiety Scale, S/EST = Self-Esteem, S/EFF = Self-Efficacy.*

Statistically significant differences were found in four of the five domains, at least at the level $p<0.01$, and the homogeneity assumption was fulfilled across all comparisons ($p>0.05$). This suggests that never experiencing dieting hyperphagia was associated with greater optimism, life satisfaction and self-esteem, along with lower physical appearance anxiety.

Dispositional optimism

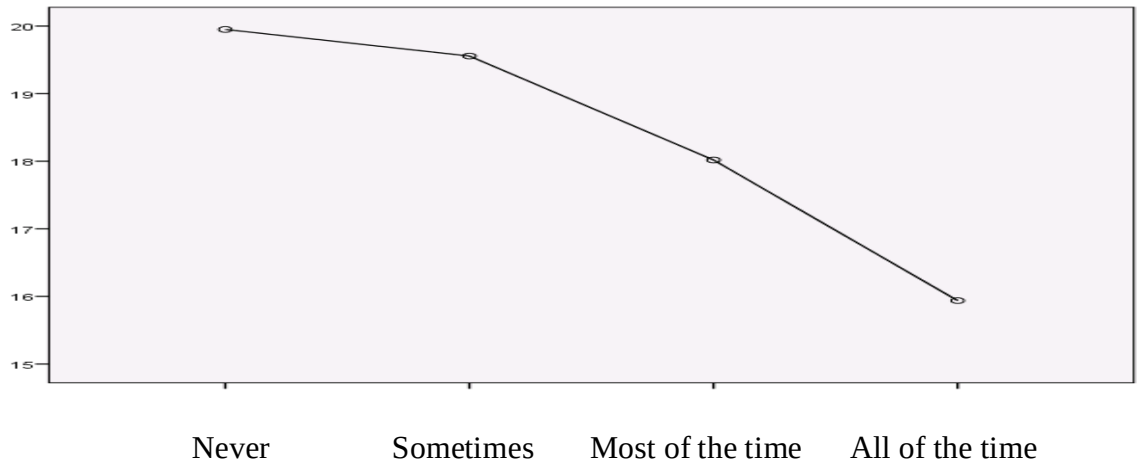


Figure 6.3: Mean scores for optimism across categories of hyperphagia

Post hoc tests revealed that those who experienced hyperphagia all of the time while actively trying to lose weight, reported significantly lower optimism than those who never experienced it, or experienced it only sometimes. This is illustrated in figure 6.3.

Life-satisfaction

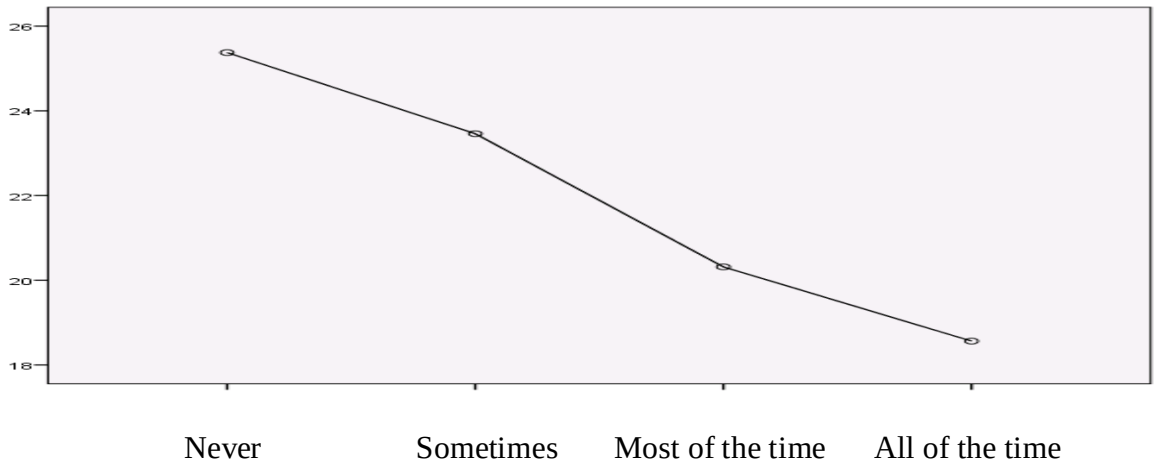


Figure 6.4: Mean scores for life-satisfaction across categories of hyperphagia

Post hoc tests revealed that those who experienced hyperphagia all of the time or most of the time while actively trying to lose weight, reported significantly lower life satisfaction

than those who never experienced it, or experienced it only sometimes, as shown in Figure 6.4.

Physical appearance anxiety

Figure 6.5: Mean scores for physical appearance anxiety across categories of hyperphagia

This pattern seen across the groups for life-satisfaction is replicated for in reverse for physical appearance anxiety, with those experiencing hyperphagia most or all of the time reporting significantly higher physical appearance anxiety than those who never experience it, or experience it only sometimes. This is illustrated in figure 6.5.

Self-esteem

Post hoc tests relating to self-esteem revealed that those who experienced hyperphagia most of the time while actively trying to lose weight reported significantly lower self-esteem than those who never experienced it, or experienced it only sometimes. This is illustrated in figure 6.6 overleaf.

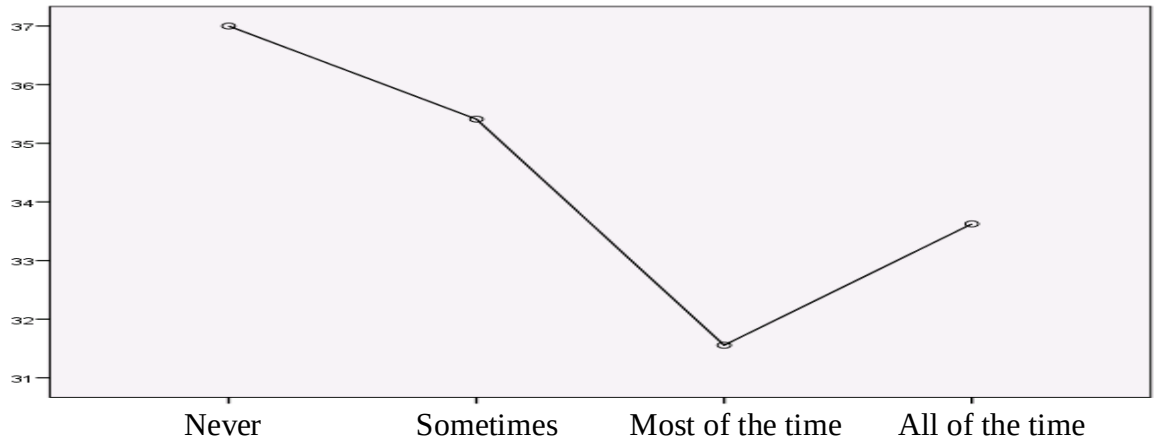


Figure 6.6: Mean scores for self-esteem across categories of hyperphagia

Self-efficacy

Although the differences between groups were not statistically significant in relation to self-efficacy, the previous trend is replicated with those who experienced hyperphagia all of the time or most of the time while actively trying to lose weight, reporting lower self-efficacy than those who never experienced it, or experienced it only sometimes. This is illustrated in figure 6.7.

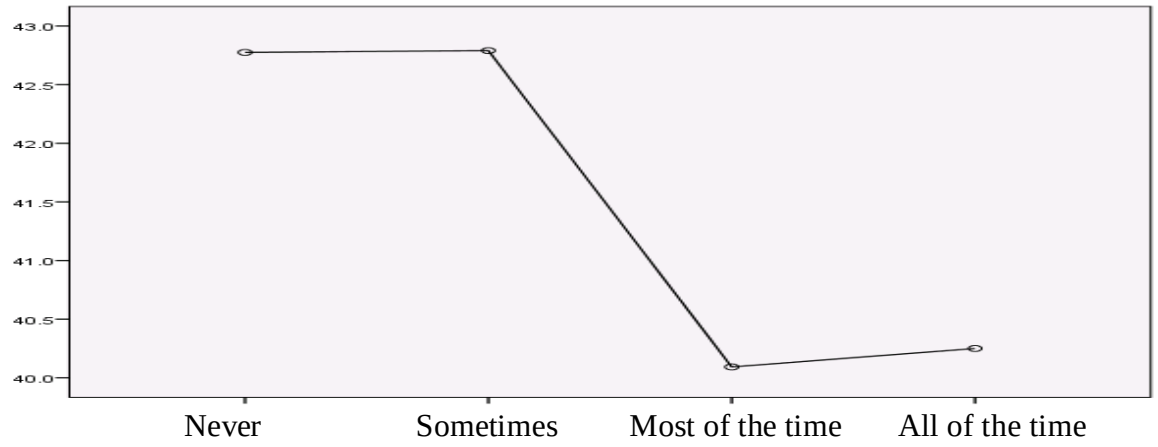


Figure 6.7: Mean scores for self-efficacy across categories of hyperphagia

Use of anti-depressant medication

Use of anti-depressant medication was found to be a significant predictor of correlates of SWB in the previous studies, so prevalence of anti-depressant use was compared across the student group and the obesity surgery group, and the results are shown in Table 6.8.

Table 6.8: Frequencies and t-test for use of antidepressant medication

Descriptor	Student Group	Surgery Group	t-test
Never used	107	26	14.40***
Used in the past	4	4	
In previous year	2	4	
In previous 6 months	0	35	
Yes current use	5	47	
Mean (sd)	0.24 (0.85)	2.63 (1.58)	

$p<0.001$

It is clear that the difference is stark, with 107 students (90.68% of cohort) having never used anti-depressants, while the figure is only 26 for obesity surgery patients (22.41% of cohort). Comparisons for current usage is equally distant, with only 5 students (4.24% of cohort) currently using anti-depressants compared to 47 obesity surgery patients (40.52% of cohort). Taking account of previous and current use of anti-depressant medication, only 11 students (9.32% of cohort) had ever used them, compared to 90 obesity surgery patients (75.9% of cohort).

Discussion

The research aims of identifying areas of similarity and difference in correlates of SWB between a female dieting student group and a female obesity surgery group were met. Results were largely as predicted with similar moderately high levels of openness and conscientiousness, along with very high levels of agreeableness reported for both the dieting student group and the obesity surgery group. However, there were significant differences in respect of extraversion and neuroticism, with the student group presenting as more extraverted and emotionally stable than the obesity surgery group. The more introverted responses from the surgery group could be explained by the desire to hide away and not be visible in society, which was reported in chapters four and five. The higher levels of neuroticism in the surgery group could be related to experience of obesity stigma, also reported in chapter four, along with the well-reported relationship between mood disorders and obesity. As expected, the obesity surgery group reported significantly lower levels of life satisfaction than the student group, which is unsurprising given the limitations on life associated with severe obesity that were disclosed in chapters four and five. Again, given the physical appearance anxiety issues associated with obesity, it is unsurprising that the obesity surgery group reported significantly higher levels of physical appearance anxiety than the student group, despite obesity being considered less acceptable in an adolescent group (Farhat et al., 2010).

In terms of prevalence of hyperphagia, there was surprisingly little difference between the groups, with experience of head-hunger 'sometimes' being the most frequently reported response for both groups. However, the intensity of the experience was significantly greater for the obesity surgery group than the student group, with a

much higher proportion of the obesity surgery group experiencing hyperphagia ‘most of the time’ or ‘all of the time’. This is not represented in the literature and makes an important contribution to knowledge because the students at the beginning of the actively dieting/weight cycling lifestyle who are experiencing hyperphagia ‘sometimes’ could become their obesity surgery counterparts trapped by the obesity/weight cycling lifestyle. This supports the notion of moving away from dieting to lose weight and moving towards a strategy of behaviour change to improve health and well-being, as proposed by Mann (2007, cited in Wolpert, 2007).

The student group and the obesity surgery group were then combined to test the relationship between frequency of hyperphagia and correlates of SWB, and it was found that those who experienced hyperphagia ‘most of the time’ reported significantly less openness than those in the other groups. This supports the findings of study 7, where the married couple described a frequent compulsion to overeat even when they derived no pleasure from feeding; an activity that they kept hidden. There was a non-significant linear pattern with conscientiousness which demonstrated the role of self-control in this factor, which could have implications for weight management interventions. Frequent experiences of hyperphagia were significantly associated with low optimism, low life-satisfaction, low self-esteem and high physical appearance anxiety, suggesting that hyperphagia directly influences correlates of SWB in a dieting context.

The obesity surgery group reported a significantly higher prevalence of anti-depressant medication use which was as predicted based on the findings from study 9. This was a factor for which there was very little similarity between the groups.

Chapter 7

General discussion

Obesity is a natural evolutionary phenomenon of the modern world where exposure to high density fast food is combined with a more sedentary lifestyle to create an obesogenic environment (Hill & Peters, 1998), and it is predicted from current trends that the majority of adults world-wide will be obese by 2030 (Kelly et al., 2008). The societal impact of obesity is in terms of increased physical illness (Alley & Chang, 2007) and mortality (Flegal et al., 2013) along with associated costs relating to health care (Stephenson, 2013) and benefit payments (Gatineau et al., 2013), but population-based interventions to address the issue using nudge theory (John et al., 2011) have had only limited effect, perhaps due to difficulties associated with dissonance between policy makers, health professionals and public perceptions of obesity (Greener, Douglas, & van Teijlngen, 2010). Increased media interest in the undesirability of obesity has legitimised obesity prejudice and stigma (Dickins et al., 2011) so the obese have low social status (Burns & Gavey, 2008) and the discrimination experienced is pervasive (Carr & Friedman, 2005) leading to associated mental health illnesses (Kyron et al., 2011).

The prevalence of obesity onset in childhood and adolescence is also increasing (Hendriks et al., 2012), putting these young people at greater risk of becoming obese adults (Crothers et al., 2009). The impact of targeted interventions to increase exercise and reduce fast food and soft drink consumption in children and adolescents has been mixed (Chang & Nayga, 2010: Terry-McElrath et al., 2013), with only moderate short-term success recorded. Obesity is highly stigmatised in adolescence and can lead to psychological distress in the form of body image dissatisfaction (Heron & Smyth,

2013), depression (Boutelle et al., 2010), anxiety (Anderson et al., 2007) and low self-esteem (McClure et al., 2010).

The overwhelmingly negative associations with obesity suggest that it is not a conscious lifestyle choice, but rather the outcome of unconscious emotional brain networks that make pleasurable feeding to reduce anxiety the default position (Dallman, 2010). Evidence demonstrates that the obese feel pressure to make repeated efforts to lose weight, with only short-term success (Glenn, 2013), because diet and exercise interventions are appropriate for the overweight rather than the obese, for whom obesity surgery is a more efficacious treatment (Wilding, 2007). However, obesity surgery is not equally successful in terms of weight-loss (van Hout et al., 2007) and although the reason for this is unknown, it is likely to have a psychological component relating to emotional eating.

SWB relates to the internal subjective experiences of an individual (Diener at al., 1997) and is a fertile area of research within the domain of health psychology with calls for research on identifying levels of SWB required to produce health benefits (Diener & Chan, 2011). As the relationship between SWB and obesity is unclear, both in terms of aspects of SWB that can provide a protective factor against the negative psychological implications of obesity and aspects of SWB that can be used to facilitate sustained weight-loss, this was the focus of the current thesis. This thesis uniquely examined SWB in adolescent cohorts at the beginning of the obesity lifestyle (Part 1: Studies 1-4) and obesity surgery cohorts trapped by obesity lifestyle (Part 2: Studies 5-9), and then combined the cohorts to examine areas of similarity and difference (Part 3: Study 10). Each part will now be reviewed in turn.

Part 1 opened by exploring correlates of SWB in a mid-adolescent cohort (*N*=288), administered as part of a psychosocial intervention (Sharman, 2012), to test the suitability of the measures for an adolescent cohort (*Study 1*). Measures selected were dispositional optimism (adaptability element), life-satisfaction (cognitive direct measure of SWB), extraversion (positive affect), and neuroticism (negative affect), along with a measure of physical appearance anxiety as this was predicted to be a strong predictor of SWB for an overweight adolescent cohort.

Results showed that the measures of SWB selected were appropriate for an adolescent sample, and that physical appearance anxiety was the defining measure for this cohort. Mean scores of dispositional optimism, life satisfaction, openness, conscientiousness, extraversion and agreeableness were moderately positive, and the mean score for neuroticism was moderately negative, suggesting a sample that did not deviate greatly from expected values for an adult sample, but the mean score for physical appearance anxiety was exceptionally high. The dominance of physical appearance for this cohort was further demonstrated in multiple ways; around half of the girls were unhappy with their appearance and believed that it would affect their future happiness; they felt feeling guilty about eating and had already dieted to lose weight, all of which impacted negatively in life-satisfaction. Moreover, almost a third of the girls had already experienced appearance related bullying, which led to significantly lower life-satisfaction and increased pessimism. The dominance of appearance anxiety was also evident in the open worksheets, where the girls could not identify things about their appearance that they 'liked' so this question had to be replaced with things that they 'can live with'. Furthermore, plastic surgery was suggested by the girls as a way of improving their lives, so it was clear that low self-esteem was an issue for this cohort. Hence, a key finding of this preliminary study was the pervasive negative impact of physical appearance anxiety on SWB for mid-adolescent girls.

An evaluation of the intervention was overwhelmingly positive, suggesting that the measures were appropriate and the intervention successful, with girls identifying key messages about self-acceptance in a non-directive evaluation process. Although the intervention was very brief and used a process of providing an alternative perspective of beauty along with the principles of mindfulness to encourage the girls to experience the moment and perceive themselves from an alternative perspective (rather than full mindfulness-based training), the evaluation suggests that this resulted in increased self-awareness and self-compassion, similar to previous results found from extended mindfulness training (Burke, 2014). This has implications for educating adolescent girls to be less self-judgemental and more accepting of themselves to reduce physical appearance anxiety and improve SWB, so the key findings from this study were presented to the Liverpool Sports Partnership in order that the learning from this intervention could be applied across 22 schools in Liverpool to tackle the issue of diet, exercise and appearance anxiety in an appropriate and sensitive manner. The researcher provided training to a representative from each school to enable this process to be delivered effectively. The findings also provided a theoretical framework for a further 3 studies, based on a cross-sectional design to assess SWB across adolescence.

Studies 2, 3 and 4 were based on a large adolescent sample (N=546), ranging from early adolescence at age 12 (n=130), through mid-adolescence at age 14 (n=267), to late adolescence at age 18-19 (n=149), to expand and test the findings from Study 1.

Study 2 examined aspects of weight and shape concern across the age ranges. Measures included the correlates of SWB previously utilised, with the addition of self-esteem. Results for behavioural and cognitive aspects of appearance concern demonstrated a consistent pattern whereby the young adolescents were least affected by appearance concern and the mid-

adolescents were most affected, but this returned to almost the levels of early adolescence in late adolescence. This perhaps suggests that mid-adolescence is a period of anomaly due to hormonal changes, which reverts to a base line in late adolescence. The emotional aspects of feeling guilty about eating and feeling happy with one's appearance followed a different pattern and generated statistically significant differences across all correlates of SWB except extraversion, for all 3 groups, suggesting that the emotional aspect of appearance concern continues to impact on optimism, life-satisfaction and self-esteem beyond the critical age of mid adolescence and into adulthood. Overall, this study points to somewhere between the age of 12 and 14 as being the optimal age for a prophylactic intervention to minimise the effect of appearance concern on girls. This has implications for educators to include appearance acceptance training in schools as part of the Personal Health and Social Education (PHSE) programme, based on (i) challenging the subjective experience of physical appearance representing the whole person rather than a single aspect of a person, (ii) accepting and enhancing the aspects of physical appearance that cannot be changed using mindfulness techniques (Hoffman, 2010), and (iii) empowering adolescents to change the changeable aspects of their physique with which they are dissatisfied, with a greater focus on health rather than appearance, which could increase participation in sports and reduce obesity.

Study 3 examined the previously defined correlates of SWB across the age ranges. Results demonstrated that mean scores for dispositional optimism, life satisfaction and neuroticism were very similar across the 3 groups, but the mid-adolescent group had significantly higher physical appearance anxiety and significantly lower self-esteem than the other groups. This coincides with a time in adolescent development where there is a shift in focus, with the peer group becoming more influential, and where emotions may alternate between high expectations and poor self-concept (American Academy of Child and Adolescent's

Facts for Families, 2008), so it may be a critical time for an intervention to minimise any possible negative consequence on appearance related self-concept due to peer pressure. Levels of extraversion increased significantly with age in a linear fashion across the 3 groups, suggesting that girls may become more extravert over the period of adolescence due to the natural drive for independence and increased freedoms.

Zero order correlations showed moderately strong statistically significant relationships between dispositional optimism, physical appearance anxiety, life-satisfaction and self-esteem. As self-esteem and life-satisfaction are clearly outcome variables, while dispositional optimism and physical appearance anxiety are more dispositional in nature, this influenced the conceptual framework for regression analysis. Results showed that appearance anxiety and dispositional optimism combine to explain 31% of the variance on life-satisfaction and 41% of the variance on self-esteem across the adolescent cohort, providing further evidence of the influence of appearance anxiety for this age group and reinforcing the earlier recommendation for physical appearance training to be incorporated in PHSE in schools.

Study 4 expanded on the findings of study 3 which suggest that dispositional optimism and physical appearance anxiety, which are learned behaviours and can therefore be un-learned, may be strong predictors of self-esteem and life-satisfaction in an adolescent group. Physical appearance anxiety was split to create a hierarchical construct comprising weight-related factors and non-weight-related factors. However, the impact of these domains was remarkably similar at 0.71 and 0.66 respectively, suggesting that adolescent physical appearance anxiety goes beyond issues with weight and shape, even in a mainly overweight cohort. Results demonstrated that dispositional optimism which impacts positively, and physical appearance anxiety which impacts negatively, combine to explain 51% of the variance in life-satisfaction and 73% of the variance

in self-esteem across the cohort. Moreover, dispositional optimism was found to explain 19% of the variance of physical appearance anxiety, so has a further indirect effect on life-satisfaction and self-esteem. These findings suggest that dispositional optimism, which can be developed, may be a useful lever to use in interventions addressing psychological issues around weight and shape concern in an adolescent context. Therefore a recommendation is made that training to increase optimism could also be included in PHSE school programmes to increase life-satisfaction and self-esteem in adolescents.

Taking the findings of Part 1 as a whole, it suggests that physical appearance anxiety plays a key role in SWB for girls across the span of adolescence, particularly the emotional aspects which continue into until adulthood, and that dispositional optimism provides a protective factor for well-being. The evaluation of the workshop intervention supports the use of the PSI model (Sharman, 2012), which is based on preventing chronic healthcare conditions using educational, behavioural and cognitive approaches and has been previously recommended for use with adolescents to reduce obesity and improve mental health (Melnyk et al., 2009). The workshop design was novel because it combined appearance acceptance training as proposed by Atkinson and Wade (2012), with aspects of mindfulness-based training to influence the subjective experience of personal and interpersonal functioning, and improve well-being by increasing self-awareness, self-efficacy and self-compassion (Burke, 2014). It is therefore proposed the these approaches are integrated to promote both learning and health in schools to improve adolescent well-being, increase participation in physical activity and reduce adolescent obesity.

Part 2 focussed on obesity surgery candidates with a long-history of obesity, and a mixed methods approach was taken. Much of the literature devoted to this demographic group is based

around surgical issues or physical weight-loss, and psychologically based literature is scarce and piecemeal, so the section began with repeated in-depth interviews with a small number of participants (*N*=9), conducted over a period of 18 months, to develop an understanding of the main psychological issues for this group from their own perspective. In addition, interviews were conducted over a period of 3 years with a married couple who had both elected for obesity surgery, to identify the dynamics in the relationship that help or hinder surgical and psychological outcomes over the weight-loss journey. The findings from these qualitative studies were then tested quantitatively using validated measures that tap into SWB.

Study 5 explored the demographic background of the obesity surgery candidates leading to the decision to opt for the surgery. Results concurred with findings from previous literature, but expanded the existing knowledge by examining why participants made the decisions they made. All of the participants had struggled with controlling their weight since childhood and there was a strong history of family obesity, supporting the findings of Crerand, (2006). Participants attributed the family history of obesity to biological factors rather than social factors relating to familial diet and exercise behaviours, thus reducing their personal responsibility for weight-gain and maintenance. A further finding that reinforces their biological perspective was that 7 of the 9 participants also had at least one family member who had also undergone obesity surgery. Interestingly, all participants except one attributed the initial weight-gain to emotional trauma or emotional neglect in childhood. Although this finding was unexpected, it is mirrored in the literature concerning anorexia nervosa, with Jaite et al., (2012) reporting significantly higher rates of childhood emotional trauma and neglect in patients with binge-eating/purging anorexia nervosa than either healthy control participants or patients with restrictive anorexia nervosa. This suggests that the binge eating, which is thought to be common in the obesity surgery demographic group (Macias & Leal, 2002), may have a similar aetiology to the binge/purge

cycle in established eating disorders, which would suggest a similar psychologically based treatment may be appropriate in addition to or in place of a surgical intervention. There is a trend towards easily accessible low threshold psychological interventions for the effective treatment of binge eating and bulimic binge eating, and on-line cognitive behavioural therapy (CBT) appears to be a low-cost viable treatment (e.g. Ruwaard, Lange, Broeksteeg, Renteria-Aitziber, Schrieken, Dolan, et al., 2013) which could be replicated with obesity surgery candidates as part of the medical process. However, this intervention would need to be included in a research trial because a review of the web-based studies using CBT to treat eating disorders found that methodological quality varied, suggesting inconsistent results (Ter Huurne, Postel, de Haan, & DeJong, 2013). Therefore this original contribution to knowledge is an area for future research to assess treatment outcomes, as it has clinical implications in terms of psychological interventions to treat the childhood trauma associated with the initial weight gain in obesity surgery candidates, and suggests that obesity surgery treats the outcomes of overeating due to childhood trauma rather than the source of the problem. This could go some way to explaining why a proportion of obesity surgery patients regain the weight within a period of about 10 years.

Childhood obesity was linked to social stigma and an associated withdrawal from society, with many examples of weight-related discrimination and abuse cited. Unsurprisingly, this led to poor self-concept and low self-esteem, particularly in social situations. This social stigma extended to attempts at weight-loss, with one participant following the Weight-Watchers Programme at home because she was afraid of the response she would get to her size if she attended the class, even though the classes are targeted at the obese. Participants had an extensive history of weight cycling, supporting the findings of Gibbons et al., (2006), including diet, exercise and drug interventions. Participants were desperate to shed the excess weight with one participant changing his furniture to ‘wipe clean’ to manage the faecal incontinence associated

with a GP prescribed weight-loss drug therapy, rather than ceasing the use of the drug. Participants chose obesity surgery as their final option in the battle with obesity and all participants cited health reasons as their primary motivation, supporting the findings of Brantley et al., (2014). However, the bigger picture showed more dominant psychological motivations associated with acceptance and esteem needs, suggesting that 'health' could be the socially acceptable motivation for surgery, rather than the primary motivation. This position is reinforced by the processes involved in accessing NHS funded obesity surgery, with NICE guidelines making recommendations based on BMI and physical health needs rather than psychological health needs. This novel contribution to knowledge suggests a change in NHS policy to include psychological motivators for obesity surgery could improve long-term surgical outcomes, because pre and post-surgical assessments would include psychological monitoring in addition to physical assessment.

Study 6 examined the outcomes of obesity surgery, and results suggest an overall trend of improved psychological function post-surgery, supporting the findings of the previous literature (Guisado et al., 2001; Hayden et al., 2014). However, the longitudinal data from the current study indicates that this improvement is not the simple cause and effect linear progression as previously thought, but rather a pattern of change over time beginning with a period of elevated mood directly after surgery, followed by a period of uncertainty, followed by a period of increased psychological well-being. There was an associated pattern of anti-depressant use whereby the medication was stopped post-surgery and then resumed one year to eighteen months later.

The period of uncertainty is thought to be associated with adjustment to the loss of using food as a coping strategy, with participants grieving for their relationship with food.

Some participants could not give up their previous relationship with food and despite physical restrictions, continued to eat to the point of pain or vomiting because of the overriding emotional compulsion to eat, supporting the findings of Facchiano et al., (2013). The current research expanded the existing knowledge by identifying that the focus for the participant was not on strategies to eliminate the emotional eating, they clearly felt powerless in that respect, but on methods of coping with purging the food afterwards. This compulsion to maintain the previous relationship with food is also reflected in the content of post-operative diets which, contrary to previous research (Graham et al., 2014; LeRoux et al., 2011), often contained emotion laden foods such as chocolate, crisps and ice-cream, that satisfied the psychological need to eat but compromised the weight-loss. These factors combine to suggest clinical recommendations in respect of post-surgical psychological services during the adjustment phase to manage emotional eating, which would be beneficial to yield more consistent long-term surgical outcomes.

The factor that was attributed to having the greatest impact on SWB in this obesity surgery sample was increased participation in society following weight-loss. This was associated with reduced shame and increased confidence, self-esteem, optimism, self-efficacy and openness, along with a change in sexual identity from non-sexual to sexually active. However, the participants did not always have the emotional maturity and experience to manage the social interactions competently because as obese adolescents, they had often been bypassed by much of the adolescent social interaction experiences where these skills are typically learned. This was an unexpected negative outcome associated with the positive experience of increased participation in society, suggesting that obesity surgery candidates would benefit from managed social interaction, which is a need that could be met by

targeted social interventions based at the obesity surgery information charity, wlsinfo.org.uk.

Participants reported increased agency in their lives, with those who had self-funded surgery demonstrating a much stronger drive for change, and therefore a greater likelihood of success, than those whose surgery had been NHS funded. This could be due to greater psychological commitment to the surgery associated with personal sacrifice, which again has implications for clinical practice. While the extremely small sample size is a clear limitation of this finding (2 were self-funded and 7 were NHS funded), it should not be discounted. The NHS obesity surgery process could be examined with an intention to increase patient autonomy wherever possible, to increase agency for sustained change leading to long-term weight-loss maintenance.

Study 7 was unique in that it explored the dynamics of the relationship between a married couple going through obesity surgery, from the pre-surgical stage to 3 years post-surgery, to identify the mechanisms within relationships that can help or hinder progress. Both participants had experienced childhood trauma and were on a cycle of emotional eating, weight gain and shame, and they facilitated each other's maladaptive relationship with food. Food was the one element that bound them together, and they planned to exchange this joint addiction to food with adherence to a healthier regime. This potentially difficult intended behaviour change was examined using the theory of planned behaviour (Ajzen, 1991), and it was found that because the drive for emotional eating was much stronger than the consequence of a slow-down in weight-loss or weight regain, and there was no change in subjective norms along with a lack of perceived behavioural control, the intended behaviour change failed and the weight-loss stopped. Because of the absence of

perceived behavioural control, the participants took no responsibility for their weight-loss and instead focussed their attention on their disappointment at the 'failure' of the surgery outcomes that they were self-sabotaging. Indeed, the husband then went on to undergo further obesity surgery. This goes some way to explain why some obesity surgery patients experience poorer outcomes than others, answering the question posed by van Hout et al., (2007) regarding outcome inequality, and suggests that there may be a clinical benefit in implementing the theory of planned behaviour with obesity surgery candidates before surgery to optimise outcomes. While perceived behavioural control has been the strongest predictor of dietary change (Mullan, & Xavier, 2013) and exercise behaviour (Plotnokoff et al., 2013) within the theory of planned behaviour model in traditional obesity samples, subjective norms and attitudes are also known to play much larger roles in planned diet and exercise behaviour changes in obesity surgery samples (Hunt, & Gross, 2009). This finding was supported in the current study where subjective norms around food and exercise remained unchanged (binge eating with no exercise), attitude toward change was passive, and perceived behavioural control was low, resulting in limited weight-loss following obesity surgery. Therefore, it is suggested that obesity surgery candidates undergo pre-surgical group sessions using the theory of planned behaviour to actively plan achievable changes to diet and exercise to change subjective norms, develop an active attitude toward change, and increase perceived behavioural control.

The couple's expectations about the outcomes of surgery were perhaps unrealistic, supporting the findings of Price et al., (2013), as they expected to emerge from surgery as totally different people, with the husband using the analogy of gender reassignment surgery, and they planned to begin a new improved life together. They did both shed a considerable amount of weight and looked very different, but their relationship was not improved. Indeed

the outcome of the obesity surgery was to reveal the psychological issues that had been previously hidden by the comfort eating coping strategy. They both transitioned through the difficult adaptive stage at different rates because the husband was receiving psychological support but the wife was not. This led to miscommunication and disagreement because the wife was holding onto the pre-surgical eating behaviours more strongly than the husband, so they each experienced the other to be sabotaging their weight-loss. They recognised that their issues around food were psychologically driven, and suggested that pre-surgical psychological support could have improved outcomes or even removed the need for surgery. Without the joint 'activity' of food they had nothing to bind them together, which led to reduced intimacy and eventually divorce. This has important implications for the role of partners and carers in post-surgical success, with recommendations to identify healthy substitute joint activities away from food as a replacement for rituals around over-consumption of food, along with raising awareness of the use of food to demonstrate affection.

Study 8 piloted a quantitative study with the 9 qualitative participants to assess suitability for anonymous online data collection with an obesity surgery sample. The measures used assessed the five personality factors, dispositional optimism, life satisfaction and self-esteem, as in the adolescent studies, with the addition of measures of depression, eating disorders and self efficacy. Physical appearance anxiety was omitted because it was considered too sensitive for this demographic group. Results demonstrated normality and stability across the measures. Participant feedback raised concerns about the suitability of a measure of depression in an online study with a demographic group where prevalence of depression is likely to be high (only 3 of the 9 participants did not have symptoms of depression) and where individual feedback would not be available, so this was removed and

replaced with a question about use of anti-depressant medication as a proxy for depression. However, physical appearance anxiety was considered appropriate so it was included in the study. Participants also suggested that questions regarding health, quality of life, and personal relationship status should be included, along with a question about post-surgical hyperphagia. These recommendations were adopted for Study 9.

Part 2 concluded with *Study 9*, which explored SWB in a difficult to reach obesity surgery sample not affiliated to a specific clinical setting (*N*=125). The sample was mainly female (*n*=116) and middle aged (mean age = 42.74), with a wide range of surgical procedures undertaken, and the time scale for surgery ranged from pre-surgical to 3 years 4 months post-surgery, so it was highly representative of the obesity surgery population. Results showed that those who had opted for the least invasive surgery (gastric band) had the healthiest SWB profile but were the least satisfied with the surgical outcomes, possibly because of the slower process of weight-loss. Post-operative changes to physical and psychological health were mainly positive, as were changes to quality of life, and these were associated with increased participation in society, providing support for the outcomes of Study 6.

Overall mean scores for the majority of the measures were nestled around the mid-point of the scales, but mean scores for both neuroticism and agreeableness were higher than would be expected for a normative adult sample and physical appearance anxiety was lower than expected. This is perhaps representative of a sample that has experienced sustained social stigma so has a greater than expected desire for social acceptability. The lower levels of physical appearance anxiety were unexpected, but could be due to increased physical self-acceptance following significant weight-loss.

Zero order correlations suggested strong relationships between the internal personality factors of conscientiousness, extraversion and neuroticism, and the dispositional characteristics of optimism and self-efficacy, and the outcome measures of self-esteem and life-satisfaction. Path analyses revealed that the personality factors were mediated by the dispositional factors to collectively explain 32% of the variance in life-satisfaction and 68% of the variance in self-esteem. While personality tends to be stable over time, dispositional optimism and self-efficacy can be developed, so could be used to improve the psychological outcomes for obesity surgery patients.

Post-surgical hyperphagia was very common in this sample, with only 8 participants never experiencing it, and this was strongly associated with binge eating. The eating disorders measure demonstrated a non-clinical sample overall, with a significant minority meeting the clinical threshold for binge eating disorder. Unsurprisingly, about 30% of the sample met the clinical threshold for bingeing, but this was reduced to less that 10% for purging. Approximately 24% of the sample met the clinical criteria for weight concern, and this was reduced to around 20% for shape concern, which covered aspects such as eating in secret, worrying about others seeing you eat, and feeling guilty about eating. Shape concern had the strongest relationship with SWB, and was positively associated with neuroticism and physical appearance anxiety, and negatively associated with self-esteem, life-satisfaction, openness and extraversion. This echoes the findings from the previous qualitative studies (5-7), and identifies issues around guilt and shame. These findings on the prevalence of binge eating is consistent with existing literature (Diaz et al., 2012), but the impact of binge eating on SWB represents an original contribution to knowledge and again points to a rationale for the implementation of low threshold psychological interventions

such as on-line CBT, which is thought to be beneficial for the treatment of binge eating (Ruwaard et al., 2013) to improve SWB and optimise obesity surgery outcomes for the significant minority od obesity surgery candidates who binge eat regularly.

Use of anti-depressant medication was used as a proxy to assess prevalence of depression in the sample, and the proportion of anti-depressant users (over 40%) was found to be significantly greater than expected at more than double that of the heaviest general population use (Easton, 2013). However, contrary to expectations, use of anti-depressant medication was consistently associated with positive SWB across all the measures, suggesting use of anti-depressant medication could be used as an indicator of those actively making changes to improve their psychological health rather than an indicator of depression. This has implications for clinical practice in terms of pre-surgical assessments, where use of anti-depressant medication could be perceived as evidence of agency rather than evidence of depression. Moreover, during post-surgical monitoring of obesity surgery patients, the use of anti-depressant medication could be perceived as an additional tool to improve psychological well-being rather than a sign of psychological weakness.

Part 3 is the final aspect of this thesis and it brings together the findings from Parts 1 and 2 to examine SWB across the obesity life-span to identify areas of similarity and difference across those near the beginning of the obesity/dieting journey and those at the end. *Study 10* examined the previously utilised measures of SWB, in addition to questions about anti-depressant medication and hyperphagia in a matched sample of female dieting students (n = 118, mean age 18.5) and female obesity surgery patients (n = 116, mean age 42). Levels of openness, conscientiousness, agreeableness, optimism, self-esteem and self-efficacy were similar across the groups, but the students reported significantly greater

extraversion and life-satisfaction, along with significantly lower neuroticism and physical appearance anxiety than the obesity surgery patients. Unsurprisingly, there was also a stark difference in use of anti-depressant medication with only 11 students ever taking these drugs compared to 90 obesity surgery patients.

There was some similarity across the groups in experience of hyperphagia when dieting, with the response of experiencing it 'sometimes' being the most frequently selected response for both groups. However, the obesity surgery group were more likely to experience it 'most of the time' or all of the time' than the student group. Moreover, experiencing hyperphagia 'most of the time' or all of the time' was significantly associated with greater levels of physical appearance anxiety and lower levels of optimism, life-satisfaction, openness, self-esteem and self-efficacy.

The similarities across the 2 groups suggest that the obesity surgery candidates do not differ significantly from the typical dieting population, and where they do differ, for example by being less extravert and emotionally stable and having greater appearance anxiety and lower life-satisfaction, this is likely to be a product of long-term obesity stigma rather than an inherent psychological flaw. The dieting students who 'sometimes' experience hyperphagia could potentially become women who experience it 'all of the time' if the cycle of diet/deprivation becomes embedded over time. This could then potentially develop into binge eating with associated weight gain, and these students could become the obesity surgery candidates of the future. This suggests that there could be a benefit to teaching strategies based on mindfulness techniques around accepting and trusting present moment experiences rather than acting on cognitive heuristics of drives to eat, to reduce hyperphagia in dieting women and prevent long-term obesity.

Conclusion

Taking the findings from this thesis as a whole, strong links can be seen across the obesity journey. The qualitative obesity surgery sample had all been obese children who had never recovered emotionally and had consistently used food to mediate mood, resulting in habitual weight cycling and sustained weight gain. The young overweight adolescent cohorts were already experiencing the psychological effects of being heavier than the current thin ideal, and this was evident in poor self-esteem, high physical appearance anxiety and a desire for plastic surgery. The older adolescent dieting sample was already on the restriction-binge cycle with 72% having experience of hyperphagia when dieting, while the quantitative obesity surgery sample illustrated the outcomes of embedding these behaviours.

In terms of diagnosing a problem or a propensity toward a problem at an early stage, physical appearance anxiety (PASTAS) has emerged as momentous within this study. Its most accentuated effects are seen in comparison between three female cohorts: 12, 14 and 18/19 year olds. In the midst of a cluster of comparative constructs between these three groups, PASTAS is the measure where the change in pattern is clearly observed in mean scores across the groups. Although this was a cross-sectional study and does not therefore represent mean shift over time in the strict sense, because all the other constructs (except for a smaller variation on self-esteem) remain fairly even across the groups, physical appearance anxiety measure emerges as a key construct in identifying a potential problem at a crucial developmental phase in early adolescence. Also, its association with the other constructs suggest that it is both detrimental to well being and debilitative to change.

Just as physical appearance anxiety has emerged as crucial in identifying the psychological issues associated with being overweight or obese; it appears that optimism may be vital in counteracting these issues. Within this study, optimism appears to be related advantageously and adaptively to all the other constructs, and its role in the Structural Equation Model suggest that it impacts both directly on life-satisfaction and self-esteem, and indirectly on both through physical appearance anxiety. Moreover, although the measure used, the Life Orientation Test, is a measure of dispositional optimism, researchers in this sphere also conclude that optimism can be developed by learning and cognitive restructuring, often through cognitive behavioural mechanisms (Abu El Dyiar, 2010; Sproule, Gray, Turner & Bryant, 2013), suggesting that the predisposition for optimism or pessimism can be manipulated. Like hope and self-efficacy, realistic optimism embodies personal agency, empowerment, control and the possibility of a shift in perspective when approaching a chronic and inveterate problem such as long-term obesity.

However, optimism should be tempered with reality to avoid unrealistic optimism, as defined by Weinstein (2000, cited in Bassett, Garrick, Fogarty, Giacalone, Kapuscinski, Olmstead et al., 2008) which lacks agency and leads to the passive-aggressive stance that was illustrated by the couple in Study 7. Unrealistic or blind optimism may be associated with the expectation that obesity surgery is a catch-all solution that will irrevocably change the lives of the patients, without them having to be responsible for their own poor decision-making in respect of diet and exercise. It is this type of mind-set that facilitates the thought processes whereby there is an expectation that weight-loss will occur following weight-loss surgery, even when inappropriate high calorific food is regularly consumed. The theory of planned behaviour is recommended as a tool for agentic shift in perception, autonomy and behaviour change to optimise obesity surgery outcomes.

Contrary to previous suggestions, the use of anti-depressant drugs reported within this thesis suggests that the practice is strongly related to measures of well-being and personal empowerment. It appears that users perceive themselves to have more control as personal agents and therefore possess a stronger possibility of reorienting their behaviours adaptively. According to Snyder (2000), the construct of Hope indicates that individuals can be free to set goals for themselves, set a pathway to that goal, keep a flexibility about pathways when thwarted and maintain the awareness that they are empowered as the personal agents who can bring about needed change. So although the anti-depressant drugs may not be the ultimate answer in themselves, they may lead to a shift in perception associated with the positive orientation associated with their use in this study.

A clear criticism of the studies is the use of self-report measures with the proneness to response set and social desirability associated with these, and this is compounded by the cross-sectional nature of many aspects of these studies, particularly in respect of the adolescent cohorts. However, these limitations are countered with the arguments that all measures used were psychometrically validated before the study, and the soundness of the psychometric properties were further supported within the study. Also the directions of association between the constructs were all in the expected directions (both positive and negative) and the levels of variance accounted for were quite substantial. Although much of the study is cross-sectional, the mean patterns and trends across the groups suggest meaningful findings. Furthermore, the conceptual models are configured in a manner that has elicited good fit indices, significant parameter estimates, and both direct and indirect effects coupled with good effect sizes and incremental variance through regression.

The qualitative analysis has provided a narrative so that the nomothetic findings are illustrated and grounded in the ideographic approach. In addition to the statistical models, real people are allowed to speak and to reveal their perception of their personal experiences as they have unfolded for them. Moreover, the application of psychological theory to the ideographic data moves it beyond simple narrative, and this approach to research elevates the findings from the 'what' to the 'why', and clearly demonstrates how the impact of the correlates of SWB extend beyond the external objective goal of supporting weight-loss, and onto internal processes associated with adaptation, transformation and self-acceptance.

The findings from this thesis suggest that a psychological intervention at early adolescence to increase optimism and personal agency, and to reduce physical appearance anxiety, perhaps using cognitive-behavioural-social mechanism, could go some way to prevent the diet/deprivation cycle from becoming embedded. A future study could involve a repeated measures survey involving base-line measurement of correlates of SWB at early adolescence, followed by an appropriate intervention, and then repeated measurement at mid-adolescence to assess the impact of the intervention. This should take a 2-pronged approach; to remove the emphasis from physical appearance and to increase personal agency.

A strong recommendation following the findings of these studies is that obesity surgery candidates should have access to robust psychological screening and preparation during the pre-surgical weight-management stage, and that this should form a mechanism for empowerment and increased agency based on optimism, self-efficacy and self-esteem rather than a means of excluding candidates from obesity surgery. Psychological support should also form part of the post-surgical package to enable obesity surgery candidates to

navigate the difficult stage of adaptation and change. This should ideally be delivered away from a clinical setting, to enable the patients to be open and honest. These 2 psychological interventions could combine to potentially maximise the benefits of surgery across the obesity surgery population, making it a more cost-effective solution. A future study could involve an evaluation of such an intervention, perhaps delivered by a voluntary sector organisation such as wlsinfo.org.

To conclude, the studies within the current thesis contribute to the existing knowledge by demonstrating the efficacy of SWB in supporting psychological health for the increasing number of obese individuals across all age groups. Within this framework, there is a clear contribution to knowledge in respect of the emergence of physical appearance anxiety (PASTAS) as a clear identifier of weight-related psychological problems at the transitional adolescent age; the role of optimism (LOT) as a pivotal variable in interventions because of its systematic and adaptive relationship with the other constructs; and the surprising role of anti-depressant drugs in enabling stigmatized individuals to feel empowered and motivated to take control of their personal destiny. Moreover, the combination of ideographic with a nomothetic approach provides a narrative that grounds the numbers in real experience and the constructs in real lives, and illustrates an operationalization for each of the constructs. Therefore, manipulating the protective factors in SWB, in particular optimism and self-efficacy, to optimise SWB through personal agency, could perhaps yield benefits beyond the objective weight-loss goals, by transforming self-concept beyond the ‘fat persona’ to increase self-esteem and personal self-acceptance. This goes some way to support the demand by Diener and Chan (2011) to add interventions to improve SWB to the list of public health measures required for good health and longevity.

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Appendices

Chapter 2:

Chapter 3:

2A: **Participant Information Sheet**

Name of researcher: Valerie Todd
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Title of study: An investigation into body image for young women.

Purpose of study:

Young women are bombarded with unrealistic images of women in magazines, on television and in music videos. These images are unrealistic because very few real women are naturally the shape of the women depicted, and also because many of the images are airbrushed to eliminate imperfections, or stretched to make the models appear taller and thinner. The models depicted may be role models for young women, so we want to find out if it affects how young women feel about their own bodies.

Procedures and Participants Role:

You will be asked to complete a booklet containing worksheets and psychological questionnaires. The worksheets ask you to think about your own body, and the psychological questionnaires will measure how happy you are generally. These will cover things like personality, body image and happiness. You will be given an opportunity to ask any questions and make additional comments that you think are important.

The worksheets should be completed because they form part of the 'Body Beautiful' session, but this doesn't mean you have to take part in the research. *It is your choice*. If you don't want your information to be part of the research, then take your worksheets with you when you go. If you do take part and then change your mind, you can have your information removed from the research.

The booklets will be identity coded so you will be asked NOT to put your name on the booklets. Any information that you provide will be kept strictly confidential and stored anonymously.

If you want any more information, you can ask today or contact the researcher using the contact details listed above.

2B

LIVERPOOL JOHN MOORES UNIVERSITY

FORM OF CONSENT TO TAKE PART AS A SUBJECT IN A RESEARCH PROJECT

Title of project: Body Image in young women

I, ...agree to take part in

(Participants full name)*

the above named project, the details of which have been fully explained to me and described in writing.

Signed ..... Date .....

(Participant)

I, Valerie Todd certify that the details of this project have been fully explained and described in writing to the subject named above and have been understood by her.

Signed ..... Date .....

(Investigator)

I, ...certify that the details of this

(**Witness** full name)

project have been fully explained and described in writing to the subject named above and have been understood by her.

Signed ..... **Date** .....

(Witness)

NB The witness must be an independent third party.

* Please print in block capitals

2C: ‘Body Beautiful’ Session Plan

Time	Topic	Tutor Activities	Learner Activities	Evaluation	Resources
10 mins	Introduction and talk	Explain purpose of session. Information on body types and media pressures.	Listen & question	Students pay attention and ask appropriate questions	Slides
10 mins	Focus on personal body image	Disseminate booklets, encourage students to work through to the end and identify positive attributes. Explain consent form	Complete self-report booklets and engage with material. Sign consent form if appropriate	Students questioning and evaluating their own self perception	Booklets, pens
20 mins	Graffiti wall	Explain activity, facilitate process with encouragement and enthusiasm	Participate in creative group work, make graffiti wall.	Completion of posters	Paper, scissors, glue. Paint, Magazines, brushes, stickers etc.
5 mins	Evaluation	Disseminate evaluation forms and encourage participation	Complete evaluation and reflect on experience	Completion of forms	Evaluation sheets

2D: Questionnaire Booklet

Life Orientation Test

DIRECTIONS: The statements below have been used by people to describe how they think. Read each one carefully and decide the extent to which each one applies to you. There are no right or wrong answers. Please respond as accurately as you can by ensuring that your answer indicates your own feelings and not how you believe *most people* would respond. Try not to let any answer to one statement influence your response to another.

Scale:

1 = Strongly Agree 2 = Agree 3 = Uncertain 4 = Disagree 5 = Strongly Disagree

1. In uncertain times I usually expect the best.

   1 2 3 4 5

2. If something can go wrong for me, it will.

.

   1 2 3 4 5

3. I'm always optimistic about my future.

   1 2 3 4 5

4. I hardly ever expect things to go my way.

   1 2 3 4 5

5. I rarely count on good things happening to me.

   1 2 3 4 5

6. Overall, I expect more good things to happen to me than bad.

   1 2 3 4 5

Satisfaction with Life Scale

Using the 1 – 7 scale below, indicate your agreement with each item by placing the appropriate number on the line next to the item.

7 = Strongly Agree. 6 = Agree. 5 = Slightly Agree. 4 – Neither Agree nor Disagree. 3 = Slightly Disagree. 2 = Disagree. 1 = Strongly Disagree.

1. In most ways my life is close to my ideal ----------

2. The conditions of my life are excellent ----------

3. I am satisfied with my life ----------

4. So far I have gotten the important things I want in life ----------

5. If I could live my life over, I would change almost nothing ----------

Five Factor Model

DIRECTIONS: You are now being asked to describe yourself as accurately as possible. Please respond to all of the items using the scale provided. You should indicate your answer by encircling one number on each line. It is essential that your answers reflect how you see yourself in the *present time*, and not as you would *like to see* yourself either now, or in the future.

SCALE:	Very 1-2	Moderately 3-4	Neither 5	Moderately 6-7	Very 8-9

unimaginative	1	2	3	4	5	6	7	8	9	imaginative
uncreative	1	2	3	4	5	6	7	8	9	creative
uninquisitive	1	2	3	4	5	6	7	8	9	curious
unreflective	1	2	3	4	5	6	7	8	9	reflective
unsophisticated	1	2	3	4	5	6	7	8	9	sophisticated
disorganized	1	2	3	4	5	6	7	8	9	organized
irresponsible	1	2	3	4	5	6	7	8	9	responsible
impractical	1	2	3	4	5	6	7	8	9	practical
careless	1	2	3	4	5	6	7	8	9	thorough
lazy	1	2	3	4	5	6	7	8	9	hardworking
silent	1	2	3	4	5	6	7	8	9	talkative
unassertive	1	2	3	4	5	6	7	8	9	assertive
unadventurous	1	2	3	4	5	6	7	8	9	adventurous
unenergetic	1	2	3	4	5	6	7	8	9	energetic
timid	1	2	3	4	5	6	7	8	9	bold
unkind	1	2	3	4	5	6	7	8	9	kind
uncooperative	1	2	3	4	5	6	7	8	9	cooperative
selfish	1	2	3	4	5	6	7	8	9	unselfish
distrustful	1	2	3	4	5	6	7	8	9	trustful
stingy	1	2	3	4	5	6	7	8	9	generous
relaxed	1	2	3	4	5	6	7	8	9	tense
at ease	1	2	3	4	5	6	7	8	9	nervous
stable	1	2	3	4	5	6	7	8	9	unstable
contented	1	2	3	4	5	6	7	8	9	discontented
unemotional	1	2	3	4	5	6	7	8	9	emotional

Physical Appearance State and Trait Anxiety Scale

(PASTAS) Trait version

The statements listed below are used to describe how anxious, tense, or nervous you feel *Generally* about your body. Use the following scale:

Not at All	Slightly	Moderately	Very Much So	Exceptionally So
0	1	2	3	4

Right now, I feel anxious, tense, or nervous about:

1.	The extent to which I look overweight.	0	1	2	3	4
2.	My thighs.	0	1	2	3	4
3.	My buttocks.	0	1	2	3	4
4.	My hips.	0	1	2	3	4
5.	My stomach (abdomen).	0	1	2	3	4
6.	My legs.	0	1	2	3	4
7.	My waist.	0	1	2	3	4
8.	My muscle tone.	0	1	2	3	4
9.	My ears.	0	1	2	3	4
10.	My lips.	0	1	2	3	4
11.	My wrists.	0	1	2	3	4
12.	My hands.	0	1	2	3	4
13.	My forehead.	0	1	2	3	4
14.	My neck.	0	1	2	3	4
15.	My chin.	0	1	2	3	4
16.	My feet.	0	1	2	3	4

Dichotomous Questions

1. *Do you think the way you look will affect your future happiness?* Yes No

2. *Have you ever been bullied because of your appearance?* Yes No

3. *Have you ever been on a diet to change your appearance?* Yes No

4. *Do you feel guilty about eating?* Yes No

5. *Are you happy with your appearance?* Yes No

2E:

Open worksheets: Mirror, mirror what do I see?

Things that I like about myself . . .

_____

_____

_____

_____

Things about myself that I would like to change . . .

_____

_____

_____

_____

How I could make the changes . . .

_____

_____

_____

_____

2F:

Findings from open worksheets: Mirror, mirror what do I see?

The open worksheets allowing participants to highlight areas of their body that they like was amended during the intervention to 'things about my body that I can live with' because the girls struggled to identify anything about their body that they reported to like, providing further support for the PASTAS findings. Eyes were the feature that was most acceptable to the girls (79 girls) followed by hair (56 girls). No girls managed to identify more than one feature that she 'could live with'. This could be due to peer pressure and not wanting to appear vain, or it could be a symptom of the appearance pressure that adolescents experience from society.

Girls found no difficulty in identifying areas of their body that they would like to change and frequency of body parts identified were more evenly dispersed. In terms of how the girls intended to make the changes, taking exercise and following a healthy diet were the most popular answers followed by plastic surgery. These findings suggest that this cohort may be susceptible to low self-esteem and believe that plastic surgery would be something that would improve their quality of life, so these factors are included in subsequent studies. The findings are shown in the following bar charts.

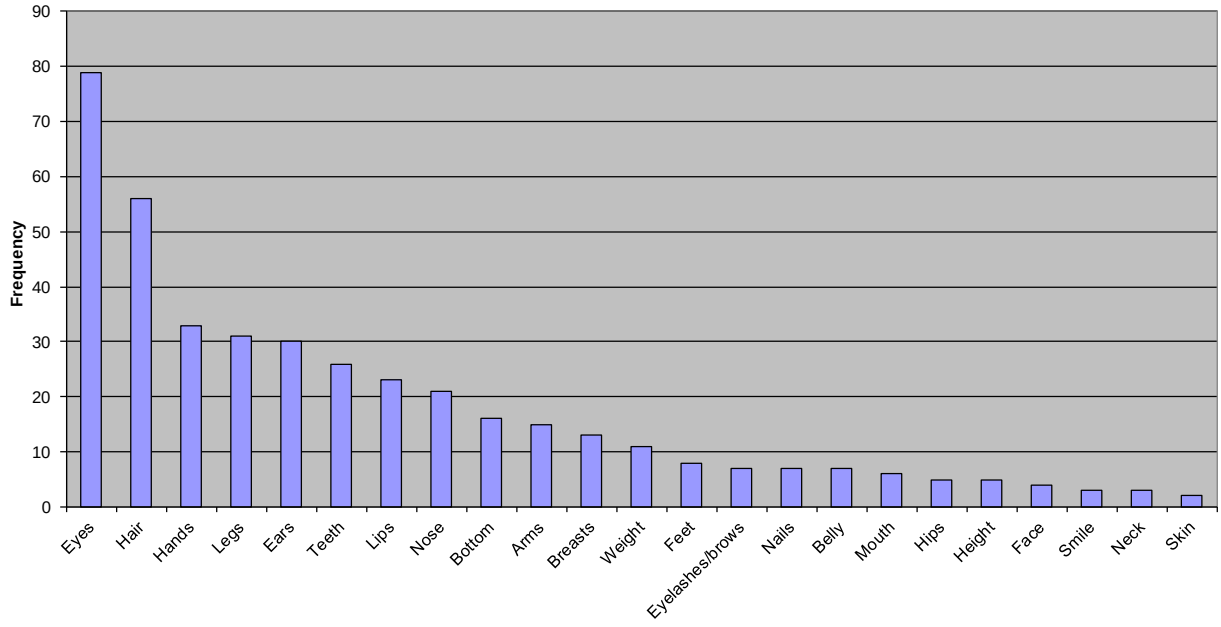


Figure2.1: Frequency chart of 'Things about my body that I can live with'

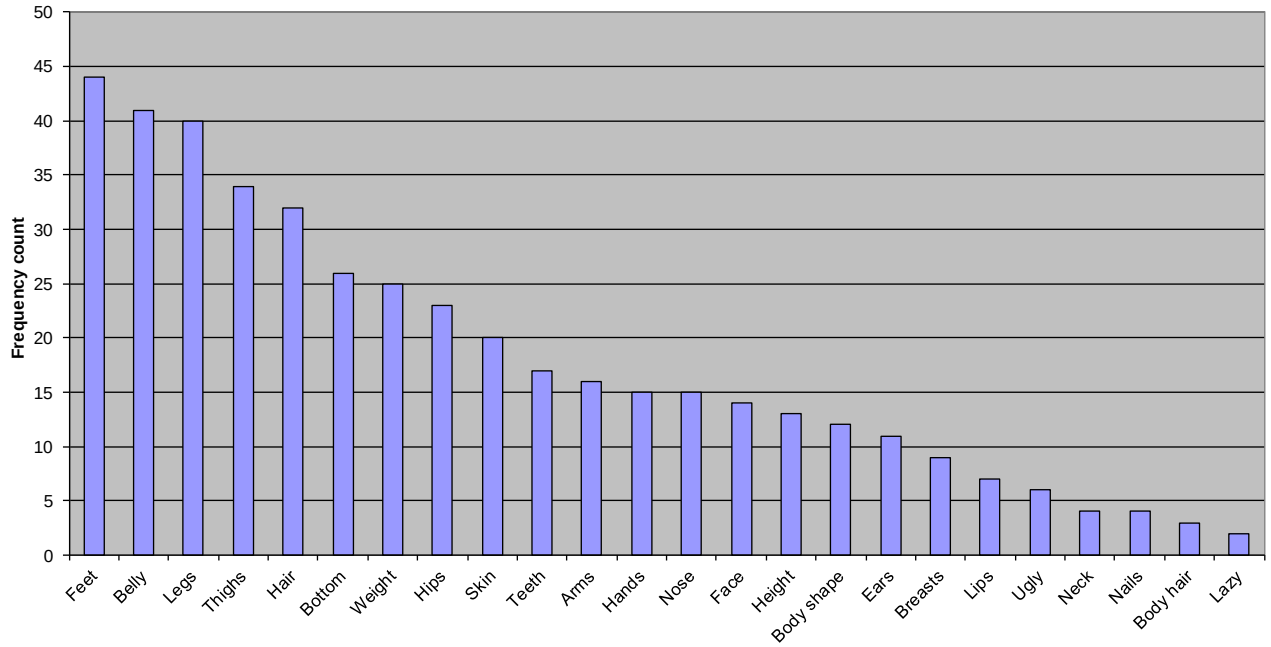


Figure2.2: Frequency chart of 'Things about my body that I'd like to change'

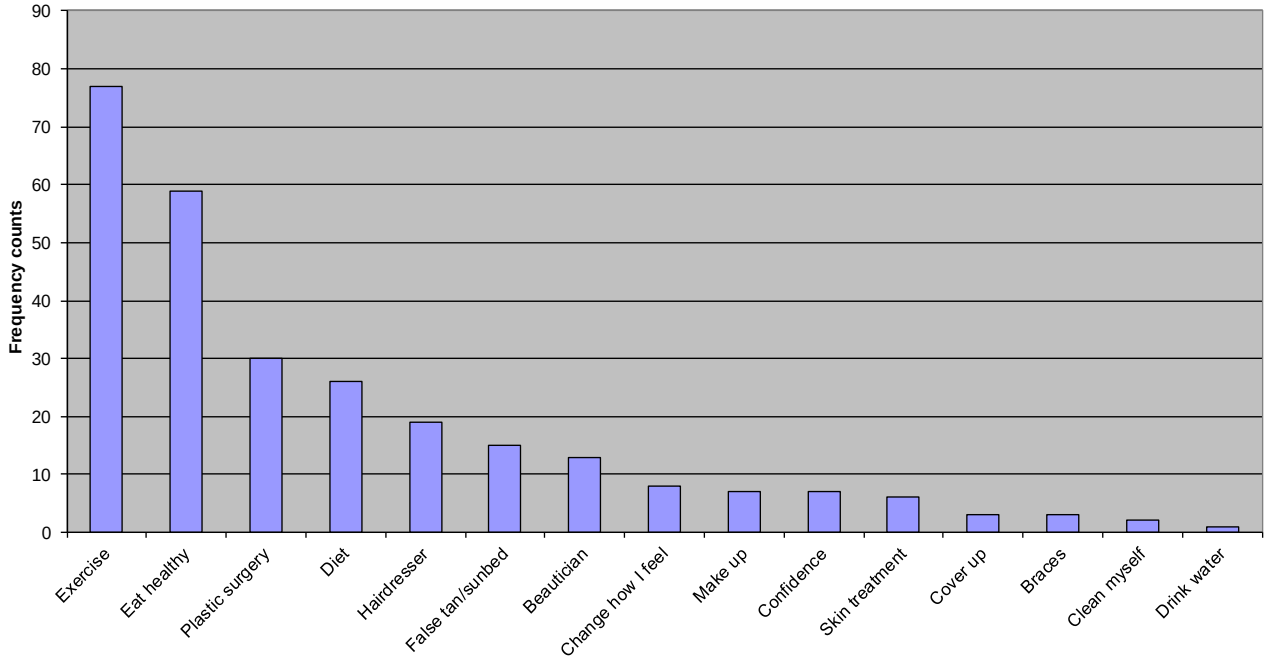


Figure 2.3: Frequency chart of 'What I need to do to make the changes'

2G: Evaluation

Things that were good today . . .

_____

_____

_____

_____

Things that could have been better today . . .

_____

_____

_____

_____

What I learned today . . .

_____

_____

_____

_____

2H:

Evaluation findings

As this study was the first intervention with the girls, they were invited to complete an evaluation form at the end of each workshop to determine the impact on the user group. The evaluation comprised of 3 open-ended statements for the girls to complete: what was good today, what could have been better today and what I have learned today. This was devised to be non-directional and open to prevent researcher bias.

Some girls chose to complete the evaluation forms while some chose not to. Other girls chose to partially complete the evaluation forms. One group got lost on the way to the workshop and was running so late that there was no time to disseminate the evaluation forms. Many girls refused to participate in the evaluation exercise because they were reluctant to cease the graffiti wall activity; this in itself is an indication that the workshop was going well. The findings do not account for all the girls, but they are a full record of those who chose to participate in the evaluation process. The findings are as follows:

'What was good today was …'

The histogram relating to this statement clearly shows that the most enjoyable activity of the body image workshop was making the poster for the graffiti wall (84 girls). The next largest categories were 'everything was good' (24 girls) and 'positive atmosphere' (21 girls). Other girls valued the opportunity to talk with group facilitators and 6 girls described the event as 'enjoyable and meaningful.' Although the evaluation referred to the body image workshop rather than the whole event, 5 girls identified a range of exercise activities as good. This suggests that the workshop was appropriate, enjoyable and accessible for many of the girls.

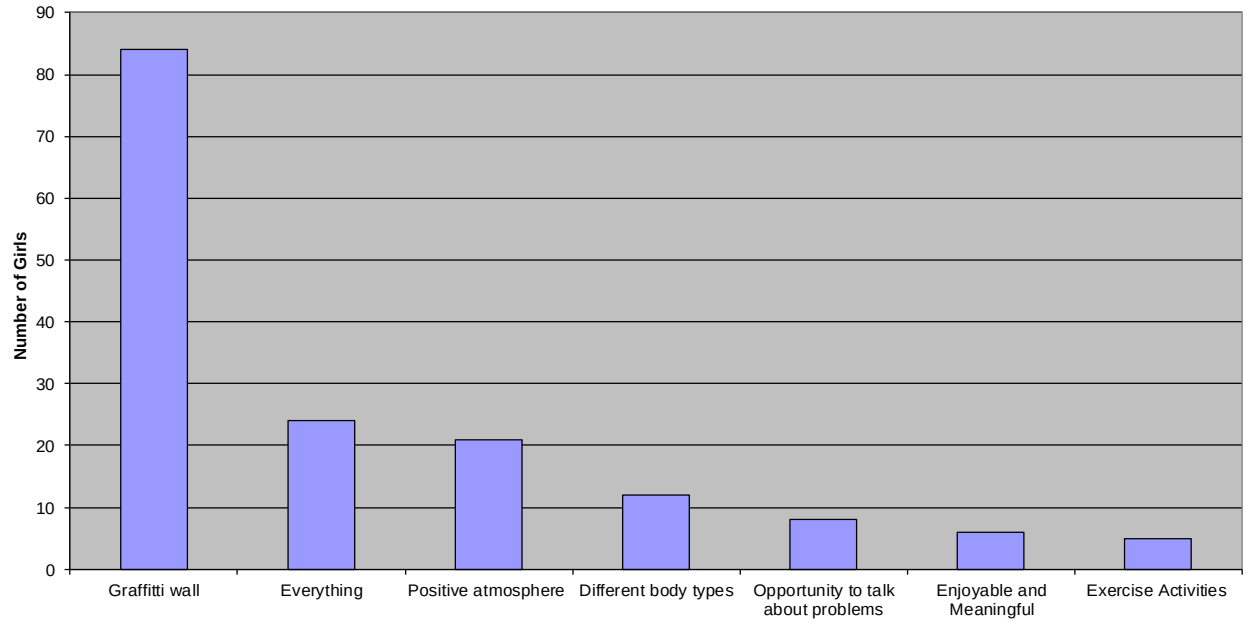


Figure 2.4: Frequency chart of 'What was good today'

'What could have been better today was…'

The histogram relating to this statement shows that for 56 girls 'nothing could have been better,' and a further 55 girls would have liked the workshop to have been longer. As these are the highest frequency categories, this also suggests that the body image workshop was enjoyable and meaningful for many of the girls, and that they would have liked it to be longer.

Seven girls stated that they would have liked more opportunities to get to know other girls from different schools, so perhaps future interventions should involve putting the girls into groups rather than simply allowing them to work with their friends. Five girls stated that they would have liked a rest period and 3 girls lamented the lack of outside activities during the sunny weather; these points could be connected. Not all the girls enjoyed the conference

as 5 girls did not like the graffiti wall activity and 9 girls did not like the exercise activities, and 1 girl wanted to choose her own activities so that she could opt out of the exercise activities that she did not like. Again, the trend suggests that the workshops went well as the main grumble was that it was all over too quickly.

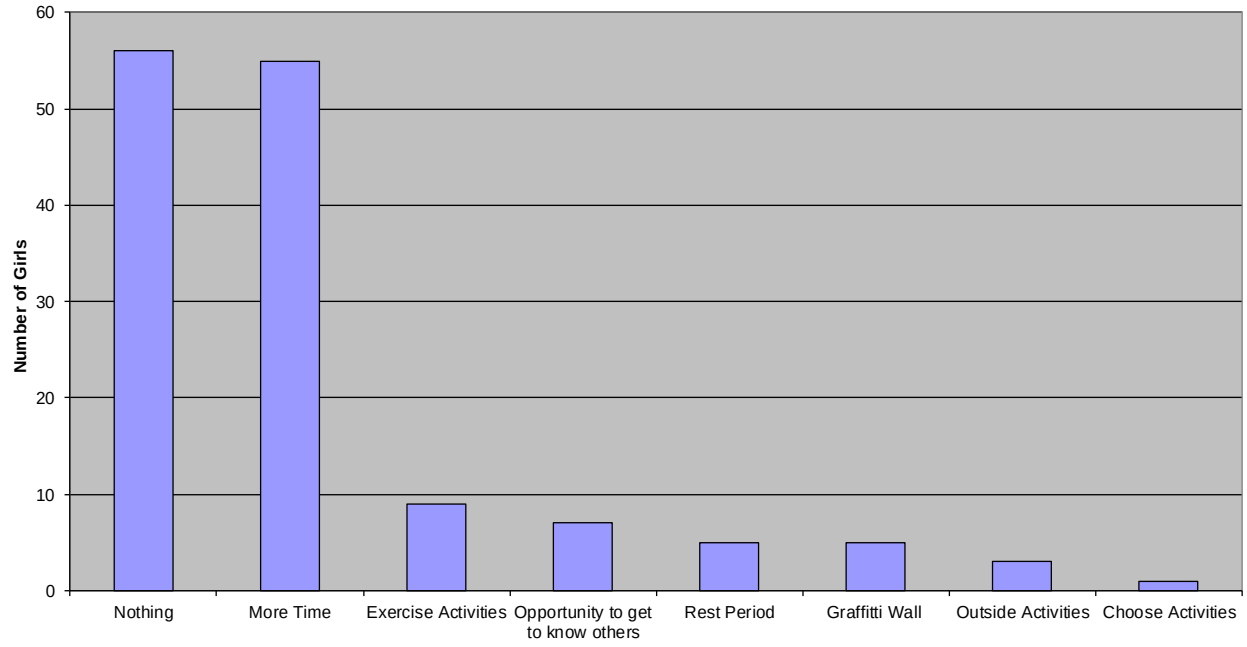


Figure 2.5: Frequency chart of 'What could have been better today'

What I have learned today was …

This statement resulted in a more diverse range of answers as is shown in figure 6. The highest frequency of responses related to girls learning to 'love themselves' (57) and to 'think positive' (54). Thirty-four girls learned to 'be confident with who they are' and 32 learned to 'be happy with who they are.' Although these statements are thematically similar and possibly connected, they have been kept separate, as they are distinctly different constructs from each other; happiness is not the same as confidence.

Twenty-six girls have learned that it is better to eat healthily and to exercise rather than to diet, and 21 girls have learned to like their body. A further 19 girls have learned that people are different from each other and may have different body types, while 17 girls have identified that you do not need to be thin to be beautiful.

In terms of additional benefits, 12 girls have learned to work cooperatively in a team and 9 girls have learned that we should respect each other, irrespective of differences. This is a positive impact relating to social skills and engaging with the wider world. Six girls have learned that it is not good to pay attention to what bullies tell you. Eight girls have learned that they can be creative and 2 girls have found that learning can be fun. Unfortunately, 1 girl claims to have learnt nothing.

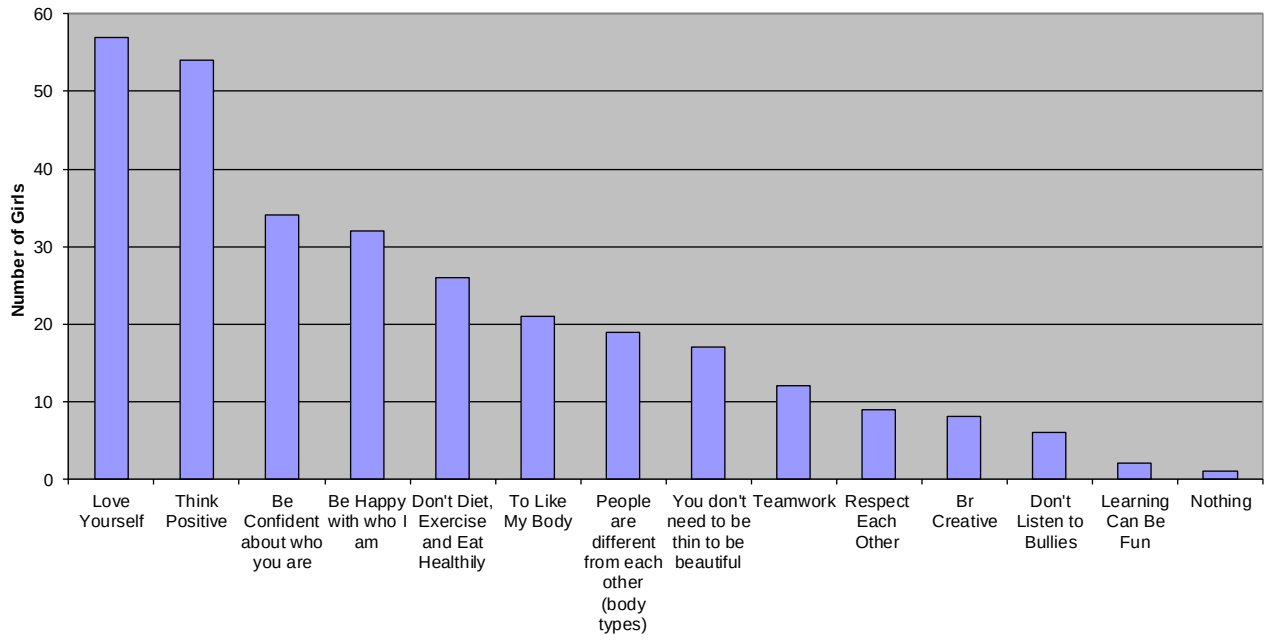


Figure 2.6: Frequency chart of 'What I have learned today'

Overall, this section shows that the girls were engaged in meaningful activity and demonstrates the impact that working in a body positive environment has on the girls'

attitudes to themselves. Girls who like, love and respect themselves and each other are more likely to engage in healthy activities and less likely to be drawn to self-abusive behaviours. This suggests that some of the main objectives of the intervention were achieved.

2I: **Graffiti wall poster examples**

2J:

LIVERPOOL SCHOOL SPORT PARTNERSHIPS
YEAR 9 GIRLS CONFERENCE

Following the success of the Year 9 Girls Conference in 2006 arranged by the South Central SSP, all 4 Liverpool SSP's were invited to attend the Y9 Conference in 2007.

AIMS OF THE CONFERENCE

- To increase participation levels in secondary school pupils towards the PSA targets, with the aim "to increase the percentage of school children in England who spend a minimum of two hours each week on high quality PE and school sport within and beyond the curriculum to 75% by 2006 & 85% by 2008."
- To motivate and inspire girls to adopt an active and healthy lifestyle which will change their lives forever.
- To introduce girls to physical activities they would not normally have the opportunity to try in the PE curriculum.
- To target girls who are becoming difficult to motivate in class, regularly excusing themselves or forgetting kit, girls who are becoming disaffected by PE and physical activity.

FORMAT OF THE TWO DAYS

South Central and South School Partnerships were allocated 100 places each on Tuesday and North and Central School Partnerships were allocated 100 places each on Wednesday. The 200 girls per day were divided into 10 groups of 20, with 4 girls from each school in each group. This gave the girls the opportunity to integrate with each other and work alongside girls from different school experiences.

All the girls were given the same programme of 5 activities, spending 45 minutes in each session. The activities included Pilates/ Yoga, Aerobics, Rock Climbing/Abseiling/ Teambuilding, JSLA, and talks on Body Image – see Appendix 1 & 2 for timetable.

They were given the opportunity at lunchtime to visit stands on Healthy Eating / Active City Campaign / D-Myst (anti-tobacco industry)

They listened to short presentations by Guest speakers (Penny Fray & Christine Burns) about pursuing active lifestyles and were encouraged to engage in lifelong activities.

Participating schools:

North	**South Central**
Archbishop Beck	Childwall
Anfield	Broadgreen
Alsop	Bellerive
Croxteth	Shorefields
St John Bosco	St Hilda
Notre Dame	

Central	South
Archbishop Blanch	Gateacre
Holly Lodge	Calderstones
St Francis of Assisi	St Benedicts
St Edwards	St Julies
Parrs Centre	Parklands
	Newheys

FEEDBACK BY PUPILS

On the afternoon of the conference all the girls were asked to complete an evaluation form. They were asked to review the day, comment on what they enjoyed, what could have been better, what they had learnt and what they would like to do again.

Positive comments the **girls** from each Partnership made about what they enjoyed:

South Central

- I enjoyed Yoga and Body Image
- I enjoyed learning about how to be healthy
- I enjoyed learning how to have a positive body image

North

They all ticked the "yes" box indicating they had enjoyed themselves
The feedback from pupils was positive, all enjoyed the day and felt they have learnt a variety of different things. Here are some of their comments.

- To be positive about yourself
- You don't have to be skinny to look good
- The way you look isn't who you are
- To work in groups
- How to stay healthy
- PE can be fun
- Don't diet, just eat healthy and exercise
- To be more confident

Central

- When you work in a team you gain more confidence
- I did a sport I thought I would never do - Rock Climbing - And I liked it!
- I would like to do it again / Great day - more please!
- It was cool / fab
- A very good day / Thank you for a great day
- I feel I have done well today
- Exercise to music and yoga was boss!
- I realised I like PE

South

- I enjoyed the pilates
- I liked climbing
- I would like to do more exercise to music

Suggestive comments the **girls** made to improve the experience:

North

- Would like to try football
- More outside activities

- Longer time there

Central

- More time on each activity
- More variety in activities
- Being with friends more - either longer breaks or in same group
- Would like some Dance sessions

South Central

- More time on each activity
- Stay in school groups

South

- More opportunity to climb
- Something other than JSLA.

PLANNING THE NEXT CONFERENCE

When the School Partnership's met to plan the Conference for 2007, they reviewed the activities that had taken place in 2006 and one of the first sessions to be included in the programme for 2007 was Body Image. This was due to the overwhelming success the feedback from 2006 had indicated. The girls had been very positive about the Body Image sessions; they had really enjoyed taking part and had gained a lot from them. The girls said they felt better about themselves and the way they looked.
Reviewing the Conference in 2007 feedback again indicated that the Body Image sessions had been very popular and had improved the girls' self-esteem. Consequently, the Body Image sessions again were among the first to be included in the programme for 2008.

CONTRIBUTION BY VAL TODD

Val has been involved since the first Girls Conference in 2005 and has become a valued member of the team. From the beginning, her support and commitment to the aims of the conference and in particular her enthusiasm for her subject specialism has been greatly appreciated. Val has thoroughly and carefully planned the content of the sessions and has provided all the necessary resources and equipment. Her presentation and delivery of the sessions has been excellent, the girls have been totally engaged in not only the practical activities but have felt secure enough to join in the discussions and share their personal experiences.
Val has also provided an extensive evaluation and report and gave a presentation to the organising committee detailing her findings from information gathered at the Conference.
Val has proved herself to be totally professional and reliable. She is thoroughly capable of planning and delivering sessions on Body Image appropriate for teenage girls and I have no hesitation in recommending her for future events.

Jean Gamble

Asst PDM
South Central SSP
Chair - Girls Conference Committee

3A: Student Participant Information Sheet

Name of researcher: Valerie Todd
School of Psychology
Liverpool John Moores University
Tel: (0151) 231 4343
Email: v.j.todd@ljmu.ac.uk

Title of study: An investigation into body image for young women.

Purpose of study:

Young women are bombarded with unrealistic images of women in magazines, on television and in music videos. These images are unrealistic because very few real women are naturally the shape of the women depicted, and also because many of the images are airbrushed to eliminate imperfections, or stretched to make the models appear taller and thinner. The models depicted may be role models for young women, so we want to find out if it affects how young women feel about their own bodies.

Procedures and Participants Role:

You will be asked to complete a booklet containing worksheets and psychological questionnaires. The worksheets ask you to think about your own body, and the psychological questionnaires will measure how happy you are generally. These will cover things like personality, body image and happiness. You will be given an opportunity to ask any questions and make additional comments that you think are important.

Participation will be rewarded with *Sona Research Points* equivalent to half an hour. However, taking part in this research is completely voluntary, and if you change your mind, you can have your data withdrawn form the research without losing these points.

The booklets will be identity coded so you will be asked NOT to put your name on the booklets. Any information that you provide will be kept strictly confidential and stored anonymously.

If you want any more information, you can ask today or contact the researcher using the contact details listed above.

3B

LIVERPOOL JOHN MOORES UNIVERSITY

FORM OF CONSENT TO TAKE PART AS A SUBJECT IN A RESEARCH PROJECT

Title of project: Body Image in young women

I, ...agree to take part in

(Participants full name)*

the above named project, the details of which have been fully explained to me and described in writing.

I understand that participation will generate Sona Research Points equivalent to half an hour.

Signed ..... Date .....

(Participant)

I, Valerie Todd certify that the details of this project have been fully explained and described in writing to the subject named above and have been understood by her.

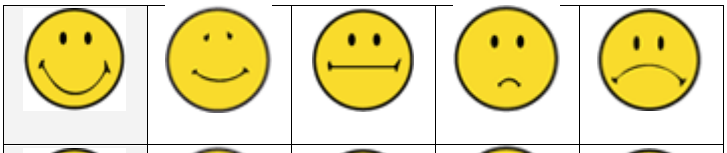
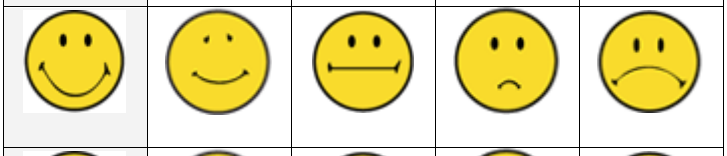
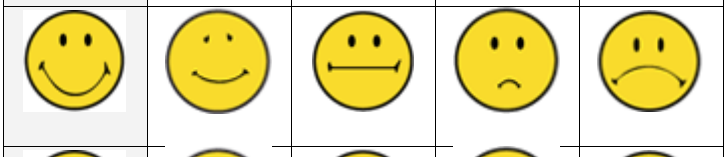
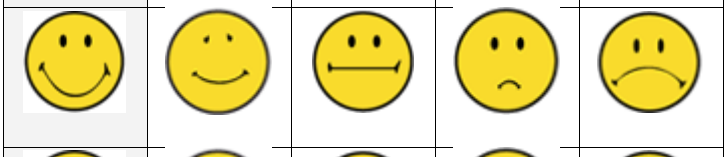
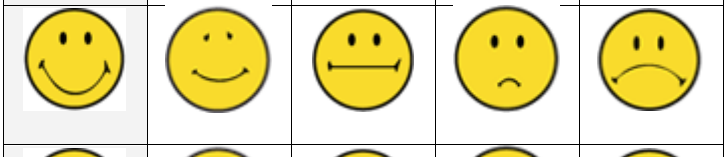
Signed ..... Date .....

(Investigator)

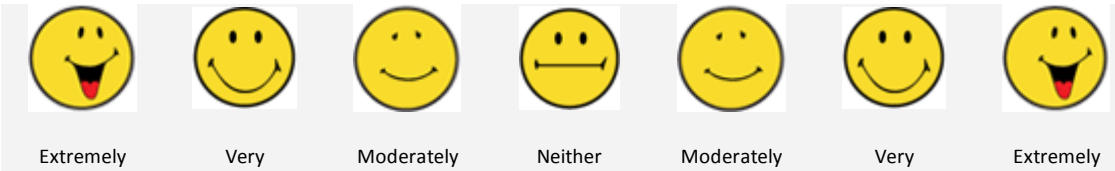
* Please print in block capitals

3C

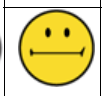
Below are six statements that you may agree or disagree with. Using the smiley face scale below, indicate your **agreement** with each item by ticking the appropriate face to the right of the statement. Please be open and honest in your responding.

1.	In uncertain times, I usually expect the best	
2.	If something can go wrong for me, it will	
3.	I'm always optimistic about my future	
4.	Overall, I expect more good things to happen to me than bad.	
5.	I hardly ever expect things to go my way.	
6.	I rarely count on good things happening to me	

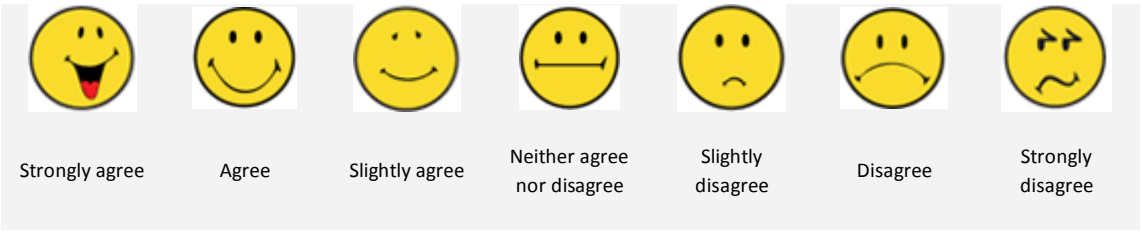
DIRECTIONS: You are now being asked to describe yourself as accurately as possible. You should indicate your answer by ticking one smiley face on each line. It is essential that your answers reflect how you see yourself in the *present time,* and **not** as you would *like to see* yourself either now, or in the future.



unimaginative								imaginative
uncreative								creative
uninquisitive								curious
unreflective								reflective
unsophisticated								sophisticated
disorganised								organized
irresponsible								responsible
impractical								practical
careless								thorough
lazy								hardworking
silent								talkative

unassertive								assertive
unadventurous								adventurous
unenergetic								energetic
timid								bold
unkind								kind
uncooperative								cooperative
selfish								unselfish
distrustful								trustful
stingy								generous
relaxed								tense
at ease								nervous
stable								unstable
contented								discontented
unemotional								emotional

Below are five statements that you may agree or disagree with. Using the smiley face scale below, indicate your **agreement** with each item by ticking the appropriate face to the right of the statement. Please be open and honest in your responding.

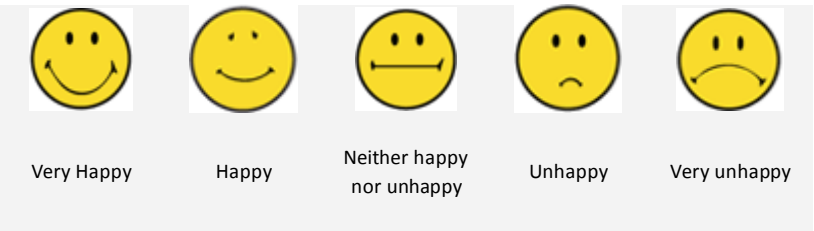


1. In most ways, my life is close to ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far, I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

Please answer the following questions by circling Yes or No

1	Have you ever been on a diet to change your appearance?	Yes	No
2	Do you feel guilty about eating?	Yes	No
3	Have you ever been bullied because of your appearance?	Yes	No
4	Do you think the way you look will affect your future happiness?	Yes	No
5	Are you happy with your appearance?	Yes	No
6	Would you consider plastic surgery to improve your appearance?	Yes	No

The statements listed below are used to describe how happy you feel right now with your body. Using the smiley face scale, indicate how happy you are with each one by ticking the appropriate face to the right of the statement.



1.	My size	
2.	My thighs	
3.	My bum	
4.	My hips	
5.	My belly (stomach)	
6.	My legs	
7.	My waist	
8.	My muscle tone	
9.	My ears	
10.	My lips	
11.	My wrists	

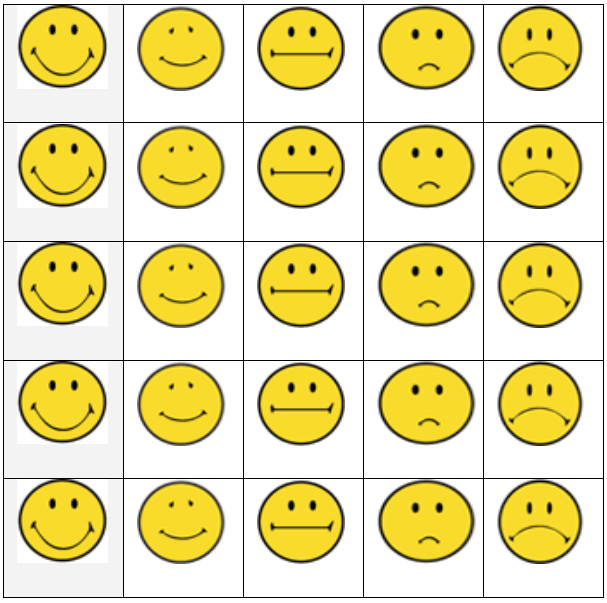
12. My hands

13. My forehead

14. My neck

15. My chin

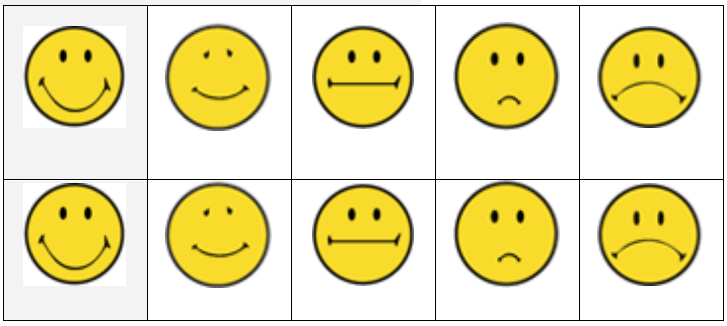
16. My feet

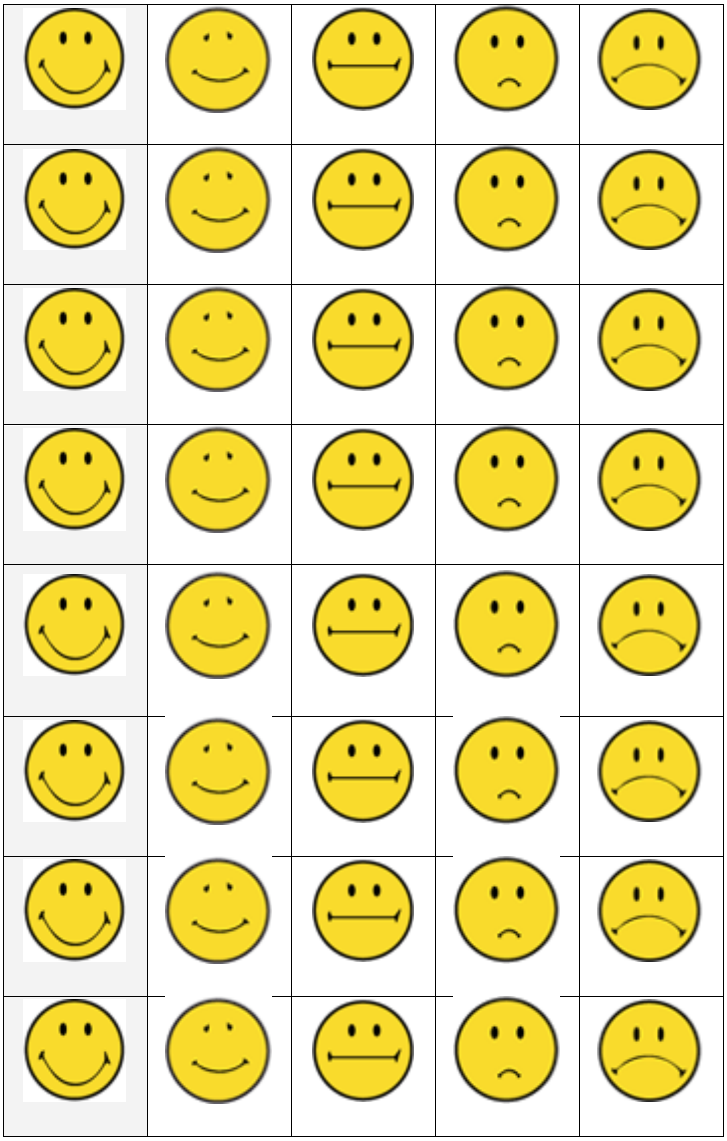


Several statements people have used to describe themselves are given below. Read each one carefully and decide the extent to which each statement applies to you. There are no right or wrong answers. For each statement, encircle the number which best describes how you think / feel MOST OF THE TIME. Work quickly through the items indicating the extent to which you **agree** with the statement.

1. On the whole I am satisfied with myself

2. At times I think I am no good at all



3.	I feel that I have a number of good qualities	
4.	I feel I do not have much to be proud of.	
5.	I am able to do things as well as most other people.	
6.	I certainly feel useless at times.	
7.	I feel that I am a person of worth, at least on an equal plane with others.	
8.	I wish I could have more respect for myself.	
9.	I take a positive attitude toward myself.	
10	All in all, I am inclined to feel that I am a failure.	

Thank you for taking part in this research

3D

Means and standard deviations for 6 dichotomous questions in 12 year olds

Group Statistics

	Have you ever been on a diet to change your appearance?	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	45	18.84	4.210	.628
	no	82	21.38	3.940	.435
Swlstot	yes	45	24.09	7.455	1.111
	no	82	26.01	5.417	.598
Extrtot	yes	45	28.93	4.330	.645
	no	82	30.01	4.072	.450
Neurtot	yes	45	19.40	7.381	1.100
	no	82	16.51	6.276	.693
Sestot	yes	45	33.33	7.857	1.171
	no	82	37.25	6.498	.718
pTOT	yes	45	26.13	11.518	1.717
	no	82	19.85	12.216	1.349

Group Statistics

	Do you feel guilty about eating?	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	44	19.41	4.515	.681
	no	83	21.05	3.935	.432
Swlstot	yes	44	23.86	7.089	1.069
	no	83	26.11	5.657	.621
Extrtot	yes	44	28.68	4.664	.703
	no	83	30.13	3.834	.421
Neurtot	yes	44	19.68	7.054	1.063
	no	83	16.40	6.420	.705
Sestot	yes	44	32.50	8.004	1.207
	no	83	37.65	6.115	.671
pTOT	yes	44	27.34	12.546	1.891
	no	83	19.29	11.283	1.238

Group Statistics

	Have you ever been bullied because of your appearance?	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	30	19.97	4.004	.731
	no	97	20.64	4.268	.433
Swlstot	yes	30	22.23	6.179	1.128
	no	97	26.29	5.991	.608
Extrtot	yes	30	29.83	3.611	.659
	no	97	29.57	4.356	.442
Neurtot	yes	30	17.50	6.517	1.190
	no	97	17.55	6.921	.703
Sestot	yes	30	33.70	7.008	1.280
	no	97	36.53	7.199	.731
pTOT	yes	30	24.80	11.115	2.029
	no	97	21.24	12.582	1.278

Group Statistics

	Do you think the way you look will affect your future happiness?	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	40	18.75	4.803	.759
	no	87	21.28	3.656	.392
Swlstot	yes	40	23.00	6.998	1.107
	no	87	26.40	5.606	.601
Extrtot	yes	40	28.98	4.902	.775
	no	87	29.93	3.797	.407
Neurtot	yes	40	18.55	7.118	1.125
	no	87	17.07	6.642	.712
Sestot	yes	40	32.98	7.804	1.234
	no	87	37.19	6.577	.705
pTOT	yes	40	27.45	12.218	1.932
	no	87	19.61	11.596	1.243

Group Statistics

	Are you happy with your appearance?	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	74	21.22	3.698	.430
	no	53	19.45	4.660	.640
Swlstot	yes	74	27.15	5.183	.603
	no	53	22.79	6.769	.930
Extrtot	yes	74	29.99	4.222	.491
	no	53	29.13	4.109	.564
Neurtot	yes	74	17.16	6.668	.775
	no	53	18.06	7.015	.964
Sestot	yes	74	38.48	5.819	.676
	no	53	32.21	7.461	1.025
pTOT	yes	74	16.18	10.031	1.166
	no	53	30.32	10.329	1.419

Group Statistics

	Would you consider plastic surgery to improve your appearance?	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	9	20.33	5.148	1.716
	no	118	20.49	4.146	.382
Swlstot	yes	9	23.56	6.386	2.129
	no	118	25.47	6.252	.576
Extrtot	yes	9	29.22	4.353	1.451
	no	118	29.66	4.184	.385
Neurtot	yes	9	17.78	6.399	2.133
	no	118	17.52	6.857	.631
Sestot	yes	9	31.00	9.124	3.041
	no	118	36.24	6.972	.642
pTOT	yes	9	32.78	10.462	3.487
	no	118	21.26	12.085	1.112

3E

Means and standard deviations for 6 dichotomous questions in 14 year olds

Group Statistics

	Have you ever been on a diet to change your appearance?	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	156	19.83	4.766	.382
	no	111	20.97	4.064	.386
Swlstot	yes	156	22.85	6.815	.546
	no	111	25.75	5.715	.542
Extrtot	yes	156	27.46	5.227	.418
	no	111	27.18	5.385	.511
Neurtot	yes	156	19.27	6.600	.528
	no	111	17.46	6.716	.637
Sestot	yes	156	32.35	8.382	.671
	no	111	36.50	7.271	.690
Pastastot	yes	156	30.81	11.045	.884
	no	111	22.38	10.731	1.019

Group Statistics

	Do you feel guilty about eating?	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	108	19.87	4.730	.455
	no	159	20.60	4.352	.345
Swlstot	yes	108	22.19	6.769	.651
	no	159	25.33	6.058	.480
Extrtot	yes	108	27.05	4.907	.472
	no	159	27.55	5.533	.439
Neurtot	yes	108	19.76	6.571	.632
	no	159	17.67	6.669	.529
Sestot	yes	108	30.80	8.350	.803
	no	159	36.30	7.299	.579
Pastastot	yes	108	32.85	10.551	1.015
	no	159	23.54	10.883	.863

Group Statistics

	Have you ever been bullied because of your appearance?	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	88	19.47	5.285	.563
	no	179	20.72	4.035	.302
Swlstot	yes	88	21.22	6.825	.728
	no	179	25.45	5.913	.442
Extrtot	yes	88	26.28	5.193	.554
	no	179	27.87	5.266	.394
Neurtot	yes	88	19.83	6.993	.745
	no	179	17.87	6.468	.483
Sestot	yes	88	30.40	9.254	.987
	no	179	35.88	6.951	.520
Pastastot	yes	88	31.56	13.185	1.405
	no	179	25.22	10.249	.766

Group Statistics

	Do you think the way you look will affect your future happiness?	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	121	19.11	4.659	.424
	no	146	21.30	4.151	.344
Swlstot	yes	121	21.74	6.816	.620
	no	146	25.98	5.613	.465
Extrtot	yes	121	26.79	5.298	.482
	no	146	27.81	5.247	.434
Neurtot	yes	121	19.60	6.748	.613
	no	146	17.62	6.539	.541
Sestot	yes	121	31.73	8.801	.800
	no	146	36.02	7.102	.588
Pastastot	yes	121	31.45	11.418	1.038
	no	146	23.88	10.750	.890

Group Statistics

	Are you happy with your appearance?	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	129	21.37	4.051	.357
	no	138	19.31	4.709	.401
Swlstot	yes	129	26.67	5.138	.452
	no	138	21.62	6.758	.575
Extrtot	yes	129	27.71	5.572	.491
	no	138	27.00	4.998	.425
Neurtot	yes	129	17.53	6.892	.607
	no	138	19.43	6.397	.545
Sestot	yes	129	37.08	6.661	.586
	no	138	31.27	8.499	.724
Pastastot	yes	129	21.51	9.955	.877
	no	138	32.73	10.503	.894

Group Statistics

	Would you consider plastic surgery to improve your appearance?	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	72	20.92	4.657	.549
	no	195	20.08	4.452	.319
Swlstot	yes	72	22.33	6.934	.817
	no	195	24.69	6.271	.449
Extrtot	yes	72	28.13	5.363	.632
	no	195	27.06	5.241	.375
Neurtot	yes	72	18.60	6.919	.815
	no	195	18.49	6.630	.475
Sestot	yes	72	31.99	9.206	1.085
	no	195	34.85	7.659	.548
Pastastot	yes	72	29.79	12.682	1.495
	no	195	26.39	11.160	.799

3F

Means and standard deviations for 6 dichotomous questions in 18-19 year olds

Group Statistics

	Have you ever been on a diet to change your appearance?	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	94	19.83	4.634	.478
	no	55	20.42	3.910	.527
Swlstot	yes	94	23.55	5.597	.577
	no	55	24.89	5.862	.790
Extrtot	yes	94	26.20	5.286	.545
	no	55	24.60	5.570	.751
Neurtot	yes	94	17.97	5.564	.574
	no	55	18.24	4.880	.658
Sestot	yes	94	35.50	7.458	.769
	no	55	36.58	6.466	.872
Ptot	yes	94	26.72	9.271	.956
	no	55	23.45	8.840	1.192

Group Statistics

	Do you feel guilty about eating?	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	55	19.11	4.818	.650
	no	94	20.60	4.022	.415
Swlstot	yes	55	22.55	5.872	.792
	no	94	24.93	5.460	.563
Extrtot	yes	55	25.06	5.683	.766
	no	94	25.94	5.279	.544
Neurtot	yes	55	19.71	5.449	.735
	no	94	17.11	5.004	.516
Sestot	yes	55	32.96	7.621	1.028
	no	94	37.62	6.208	.640
Ptot	yes	55	29.49	8.834	1.191
	no	94	23.19	8.671	.894

Group Statistics

	Have you ever been bullied because of your appearance?	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	60	19.80	4.779	.617
	no	89	20.21	4.102	.435
Swlstot	yes	60	23.98	5.592	.722
	no	89	24.09	5.824	.617
Extrtot	yes	60	26.73	5.361	.692
	no	89	24.85	5.373	.570
Neurtot	yes	60	19.10	5.722	.739
	no	89	17.37	4.918	.521
Sestot	yes	60	35.37	7.638	.986
	no	89	36.26	6.743	.715
Ptot	yes	60	26.18	8.848	1.142
	no	89	25.06	9.488	1.006

Group Statistics

	Do you think the way you look will affect your future happiness?	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	79	19.99	4.390	.494
	no	70	20.11	4.392	.525
Swlstot	yes	79	23.20	5.921	.666
	no	70	25.00	5.351	.640
Extrtot	yes	79	25.63	5.872	.661
	no	70	25.59	4.924	.589
Neurtot	yes	79	18.56	5.484	.617
	no	70	17.51	5.081	.607
Sestot	yes	79	34.44	7.816	.879
	no	70	37.54	5.835	.697
Ptot	yes	79	27.35	9.271	1.043
	no	70	23.44	8.776	1.049

Group Statistics

	Are you happy with your appearance?	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	92	20.85	4.258	.444
	no	57	18.75	4.290	.568
Swlstot	yes	92	25.77	5.368	.560
	no	57	21.26	5.163	.684
Extrtot	yes	92	26.12	4.959	.517
	no	57	24.79	6.069	.804
Neurtot	yes	92	17.36	5.102	.532
	no	57	19.21	5.473	.725
Sestot	yes	92	38.58	5.865	.611
	no	57	31.58	6.837	.906
Ptot	yes	92	22.39	8.210	.856
	no	57	30.56	8.557	1.133

Group Statistics

	Would you consider plastic surgery to improve your appearance?	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	49	19.47	4.938	.705
	no	100	20.33	4.070	.407
Swlstot	yes	49	23.63	5.480	.783
	no	100	24.25	5.840	.584
Extrtot	yes	49	26.65	5.305	.758
	no	100	25.10	5.442	.544
Neurtot	yes	49	19.47	5.561	.794
	no	100	17.38	5.065	.506
Sestot	yes	49	34.14	7.979	1.140
	no	100	36.76	6.506	.651
Ptot	yes	49	27.18	10.404	1.486
	no	100	24.70	8.520	.852

3G

Means and standard deviations for 6 dichotomous questions in combined groups

Group Statistics

	Have you ever been on a diet to change your appearance	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	296	19.70	4.644	.270
	no	250	21.00	3.986	.252
Swlstot	yes	296	23.24	6.555	.381
	no	250	25.58	5.666	.358
Pastot	yes	296	51.22	10.775	.626
	no	250	58.17	10.956	.693
Extrtot	yes	296	27.28	5.173	.301
	no	250	27.47	5.460	.345
Neurtot	yes	296	18.91	6.448	.375
	no	250	17.34	6.216	.393
Sestot	yes	296	33.51	8.104	.471
	no	250	36.74	6.821	.431

Group Statistics

	Do you feel guilty about eating	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	207	19.57	4.698	.327
	no	339	20.74	4.152	.225
Swlstot	yes	207	22.64	6.615	.460
	no	339	25.34	5.824	.316
Pastot	yes	207	49.21	10.787	.750
	no	339	57.56	10.569	.574
Extrtot	yes	207	26.87	5.207	.362
	no	339	27.68	5.344	.290
Neurtot	yes	207	19.73	6.372	.443
	no	339	17.26	6.219	.338
Sestot	yes	207	31.73	8.112	.564
	no	339	36.98	6.724	.365

Group Statistics

	Have you ever been bullied because of your appearance	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	180	19.73	4.911	.366
	no	366	20.57	4.103	.214
Swlstot	yes	180	22.27	6.396	.477
	no	366	25.32	5.961	.312
Pastot	yes	180	51.39	11.789	.879
	no	366	55.88	10.901	.570
Extrtot	yes	180	26.96	5.235	.390
	no	366	27.57	5.330	.279
Neurtot	yes	180	19.29	6.559	.489
	no	366	17.66	6.237	.326
Sestot	yes	180	32.68	8.616	.642
	no	366	36.13	6.955	.364

Group Statistics

	Do you think the way you look will affect your future happiness	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	241	19.36	4.606	.297
	no	305	21.03	4.088	.234
Swlstot	yes	241	22.40	6.576	.424
	no	305	25.82	5.578	.319
Pastot	yes	241	50.60	11.094	.715
	no	305	57.40	10.720	.614
Extrtot	yes	241	26.77	5.512	.355
	no	305	27.84	5.090	.291
Neurtot	yes	241	19.13	6.446	.415
	no	305	17.46	6.249	.358
Sestot	yes	241	32.85	8.368	.539
	no	305	36.69	6.684	.383

Group Statistics

	Are you happy with your appearance	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	296	21.19	4.028	.234
	no	250	19.24	4.591	.290
Swlstot	yes	296	26.49	5.236	.304
	no	250	21.74	6.423	.406
Pastot	yes	296	59.56	9.800	.570
	no	250	48.28	10.040	.635
Extrtot	yes	296	27.74	5.319	.309
	no	250	26.94	5.260	.333
Neurtot	yes	296	17.42	6.318	.367
	no	250	19.12	6.354	.402
Sestot	yes	296	37.90	6.226	.362
	no	250	31.55	7.885	.499

Group Statistics

	Would you consider plastic surgery to improve your appearance	N	Mean	Std. Deviation	Std. Error Mean
Lottot	yes	130	20.33	4.809	.422
	no	416	20.28	4.270	.209
Swlstot	yes	130	22.91	6.370	.559
	no	416	24.75	6.178	.303
Pastot	yes	130	50.98	11.755	1.031
	no	416	55.47	11.071	.543
Extrtot	yes	130	27.65	5.306	.465
	no	416	27.28	5.305	.260
Neurtot	yes	130	18.87	6.376	.559
	no	416	17.98	6.381	.313
Sestot	yes	130	32.73	8.762	.768
	no	416	35.70	7.214	.354

4A

EC3

LIVERPOOL JOHN MOORES UNIVERSITY

FORM OF CONSENT TO TAKE PART AS A SUBJECT IN A MAJOR PROCEDURE OR RESEARCH PROJECT

Title of project:

Obesity Surgery and Subjective Wellbeing

I, ... agree to take part in
(Participant's full name)*

the above named project/procedure, the details of which have been fully explained to me and

described in writing.

Signed..... Date.....
(Participants)

I, VALERIE TODD certify that the details of this project have been fully explained and described in writing to the participant named above and have been understood by him/her.

Signed..... Date.....
(Investigator)

* Please print in block capitals

4B **Participant Information Sheet**

Name of researcher: Valerie Todd
School of Psychology
Liverpool John Moores University
15-21 Webster Street
Liverpool L3 2ET
Tel: (0151) 231 4343
Email: v.j.todd@ljmu.ac.uk

Supervisor: Dr D Mcilroy (Director of Studies)
School of Psychology
Liverpool John Moores University

Title of study: A qualitative exploration of the relationship between obesity and subjective wellbeing

Purpose of study:
Subjective wellbeing is a measure of personal life satisfaction and overall happiness. This study is being conducted to help evaluate the factors that influence subjective wellbeing for overweight or obese people. It will look at the extent to which obesity interferes with being happy with your life, and how subjective wellbeing helps or hinders weight management strategies.

Procedures and Participants Role:
You will be interviewed by the researcher (myself) about your experiences of being overweight, and how this effects your life satisfaction and general happiness. Interviews will be conducted at a place of your choosing – possibly your home or somewhere where you feel relaxed.

Interviews will be recorded on tape and transcribed word-for word. Any information that identifies who you are will be removed. Tapes will not be kept for longer than six weeks, after which they will be destroyed, and no-one else will hear the tapes. Tapes will be securely stored in a locked cabinet in the School of Psychology. You will be sent copies of the interview transcript, which you will be asked to approve – any additional comments that you might feel are relevant at this stage can be added. You may be approached for further interviews, but you have the right to ask not to be contacted further for any reason.

The nature of this research is such that you will be asked to reflect on your experiences. If at any stage you think of things that you have not mentioned in interviews but feel might be important to the research, do feel free to contact me by phone or send me an email.

All material will be dealt with in the strictest confidence and your anonymity will be protected.

All participants have the right to withdraw from the study at any time without prejudice to access of services that are already being provided or may subsequently be provided to the participant.

4C

Weight Loss Surgery?

Are you considering, or have you undergone weight loss surgery?

Does your weight have an effect on your life generally?

We are interested in personal experiences of being overweight, and of weight loss, and how this effects life satisfaction and general happiness.

If you would like to take part in a research project about your experience of being overweight, then please call

Valerie Todd

0151 231 4343

or email v.j.todd@ljmu.ac.uk.

Liverpool John Moores University

4D Interview Excerpt

Researcher

Participant

Ok, so I saw you about a year ago.

Yeah.

And you were quite relaxed and optimistic.

Hmmm.

So do you want to tell me about what's happened, in the year?

Yeah, in the year?

Yeah, so how are you feeling now?

I think the most, two (pause) main significant things have happened, erm, is, I've erm, all my main health problems are sorted out.

Good.

So that's erm.

Because you were still having health problems last time?

I was. So I've been healthy now, (pause), erm, since the autumn really (pause).

Oh good, so that's quite a long time?

Yeah. So I've now **stopped** (emphasis) letting the thought of getting, erm, sick affect erm, my, you know my view of things? And it's not getting in the way.

Hmmm.

So, you know, I feel (pause) as if I'm dealing with the effects of the weight loss surgery (pause) unclouded.

Yeah.

And as natural now, I didn't feel natural before because I was so concerned with, **nutrition** (emphasis) and I wasn't really experiencing, or letting myself experience, you know the psychological effects, social effects or any-anything like that.

Yeah that was a focus last time, the nutrition.

Yeah, yeah. That's right, so it was all physical, physical, physical.

Yeah.

So (pause) since, in the year, especially since the autumn, which was early autumn, so you know, it was a good 9 months ago?

Hmmm.

So I've been able to focus on, well the psychological stuff has hit me like a bat out of hell.

Has it?

Yeah. **Thunderbolt** (emphasis) and it seems as if, the stuff I've not been dealing with, and-and erm, just suppressing.

Hmmm.

Has all come at once. (pause) So I'm 2 years out now, and it seems like, a whole year of stuff has hit me (pause) as-as well (pause).

Yeah.

So that's where, where I'm at psychologically, erm, on (pause) erm (pause) my life (pause) I've-I-I'm now working, so (pause) and I've now erm, separated from my husband.

Right, so 2 big changes?

2 Big changes, yeah. Yeah, erm on top of that erm, XXX (youngest child) left home, so erm, I'm no longer a mother any more.

Another big change?

Another big change. And, I know that I'm not gonna die (pause) so..

Hmmm. Another big change?

Another big change, yeah, so-so those, those have sort have had, you know, a-a an impact?

Are they all related?

Yeah. Erm, I think so, I think once I realised (pause) I wasn't going to die.

Hmmm.

And I think once I discovered that I had freedom, and that I had health and (pause) I'm only 43, erm I stopped putting up and shutting up.

Yeah?

So erm, it-it made me question Pause).

Hmmm.

Question my life, it made me change my perspective (pause) on the life I'd had **before** (emphasis) the autumn.

Right.

And the life I want, you know for the future? So the autumn was my catalyst really.

Hmmm.

4E Example of Additional Information

Dear Valerie

Sorry, I'm troubled with afterthought. Here is another example of how obesity gets in the way of medical treatment or procedures.

In 1999 I hurt my back and the doctor was unsure of the diagnosis (when it was better it was decided that it had been a trapped nerve), so he sent me for a referral with a consultant. This I got about 3 months later.

However, when I got to the hospital, I didn't get to see the consultant, just his physio, who does preliminary examinations before going on to the consultant. She made me strip down to bra and pants and after about 20 mins of scrutiny, being poked and prodded, being made to do all sorts of bends and twists and turns she said " Well, you do have a problem but there is no point referring you to the consultant, he won't do anything you are too fat!!!!!!!"

How did I feel, you ask?

Shocked, devastated, upset, angry, helpless, let down, to name but a few. But there was nothing I could do.

When I got home, to add insult to injury, it was on the news that Myra Hindley, the moors murderer, had that day been given a face lift!!! WHAT? WHY?

I couldn't believe it. I had been working for 30 years paying my tax and national insurance, she had been in jail for those years and was being given a face lift and I couldn't even have an appointment with a consultant. I felt that the world was all wrong, to say the least.

It took a long time for me to get over that and I don't think I am completely. It still makes me angry and upset to think about it.

4F General Self-efficacy Scale

DIRECTIONS: Several statements which people have used to describe themselves are given below. Read each one carefully and describe the extent to which each statement applies to you. There are no right or wrong answers. For each statement, encircle the number which best describes you MOST OF THE TIME, according to the code provided below. Please respond to all of the items and leave none unanswered.

1 = Strongly Agree. 2 = Agree. 3 = Uncertain. 4 = Disagree. 5 = Strongly Disagree.

1. If something looks too complicated I will not even bother to try it. 1 2 3 4 5

2. I try to avoid learning new things when they look too difficult. 1 2 3 4 5

3. When trying to learn something new, I soon give up if I am not initially successful. 1 2 3 4 5

4. When I make plans I am certain I can make them work. 1 2 3 4 5

5. If I can't do a job the first time, I keep trying until I can. 1 2 3 4 5

6. When I have something unpleasant to do, I stick to it until I finish it. 1 2 3 4 5

7. When I decide to do something, I go right to work on it. 1 2 3 4 5

8. Failure just makes me try harder. 1 2 3 4 5

9. When I set important goals for myself, I rarely achieve them. 1 2 3 4 5

10. I do not seem capable of dealing with most problems that come up in my life. 1 2 3 4 5

11. When unexpected problems occur, I don't handle them very well. 1 2 3 4 5

12. I feel insecure about my ability to do things. 1 2 3 4 5

4G Zung Depression Scale

Make check mark (✓) in appropriate column.	A little of the time	Some of the time	Good part of the time	Most of the time
1. I feel down-hearted and blue				
2. Morning is when I feel the best				
3. I have crying spells or feel like it				
4. I have trouble sleeping at night				
5. I eat as much as I used to				
6. I still enjoy sex				
7. I notice that I am losing weight				
8. I have trouble with constipation				
9. My heart beats faster than usual				
10. I get tired for no reason				
11. My mind is as clear as it used to be				
12. I find it easy to do the things I used to				
13. I am restless and can't keep still				
14. I feel hopeful about the future				
15. I am more irritable than usual				
16. I find it easy to make decisions				
17. I feel that I am useful and needed				
18. My life is pretty full				
19. I feel that others would be better off if I were dead				
20. I still enjoy the things I used to do				

Adapted from Zung, A self-rating depression scale, *Arch Gen Psychiatry*, 1965;12:63-70.

4H Eating Disorder Examination-Questionnaire

	On how many of the past 28 days …..	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
1	Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
2	Have you gone for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape or weight?	0	1	2	3	4	5	6
3	Have you tried to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
4	Have you tried to follow definite rules regarding your eating (for example, a calorie limit) in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
5	Have you had a definite desire to have an empty stomach with the aim of influencing your shape or weight?	0	1	2	3	4	5	6
6	Have you had a definite desire to have a totally flat stomach?	0	1	2	3	4	5	6
7	Has thinking about food, eating or calories made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
8	Has thinking about shape or weight made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
9	Have you had a definite fear of losing control over eating?	0	1	2	3	4	5	6
10	Have you had a definite fear that you might gain weight?	0	1	2	3	4	5	6
11	Have you felt fat?	0	1	2	3	4	5	6
12	Have you had a strong desire to lose weight?	0	1	2	3	4	5	6

Questions 13-18: Please fill in the appropriate number in the boxes on the right. Remember that the questions only refer to the past four weeks (28 days).

Over the past four weeks (28 days) ……

13 Over the past 28 days, how many <u>times</u> have you eaten what other people would regard as an <u>unusually large amount of food</u> (given the circumstances)?	……
14 ….. On how many of these times did you have a sense of having lost control over your eating (at the time that you were eating)?	……
15 Over the past 28 days, on how many **<u>DAYS</u>** have such episodes of overeating occurred (i.e., you have eaten an unusually large amount of food <u>and</u> have had a sense of loss of control at the time)?	……
16 Over the past 28 days, how many <u>times</u> have you made yourself sick (vomit) as a means of controlling your shape or weight?	……
17 Over the past 28 days, how many <u>times</u> have you taken laxatives as a means of controlling your shape or weight?	……
18 Over the past 28 days, how many <u>times</u> have you exercised in a "driven" or "compulsive" way as a means of controlling your weight, shape or amount of fat, or to burn off calories?	……

Questions 19 to 21: Please circle the appropriate number. <u>Please note that for these questions the term "binge eating" means</u> eating what others would regard as an unusually large amount of food for the circumstances, accompanied by a sense of having lost control over eating.

19 Over the past 28 days, on how many days have you eaten in secret (ie, furtively)? ….. Do not count episodes of binge eating	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
	0	1	2	3	4	5	6
20 On what proportion of the times that you have eaten have you felt guilty (felt that you've done wrong) because of its effect on your shape or weight? ….. Do not count episodes of binge eating	None of the times	A few of the times	Less than half	Half of the times	More than half	Most of the time	Every time
	0	1	2	3	4	5	6
21 Over the past 28 days, how concerned have you been about other people seeing you eat? ….. Do not count episodes of binge eating	Not at all		Slightly		Moderately		Markedly
	0	1	2	3	4	5	6

Questions 22 to 28: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days).

	Over the past 28 days …..	**Not at all**		**Slightly**		**Moderate -ly**		**Markedly**
22	Has your weight influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
23	Has your shape influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
24	How much would it have upset you if you had been asked to weigh yourself once a week (no more, or less, often) for the next four weeks?	0	1	2	3	4	5	6
25	How dissatisfied have you been with your weight?	0	1	2	3	4	5	6
26	How dissatisfied have you been with your shape?	0	1	2	3	4	5	6
27	How uncomfortable have you felt seeing your body (for example, seeing your shape in the mirror, in a shop window reflection, while undressing or taking a bath or shower)?	0	1	2	3	4	5	6
28	How uncomfortable have you felt about others seeing your shape or figure (for example, in communal changing rooms, when swimming, or wearing tight clothes)?	0	1	2	3	4	5	6

5A

Participant Information Sheet

Hello,

My name is Valerie Todd and I am a PhD student in the School of Psychology at Liverpool John Moores University.

I am studying the relationship between obesity and perceived well-being, and I am particularly interested in the experience of people who undergo weight-loss surgery.

As you are either contemplating weight-loss surgery, or have already had the procedure done, I would like to invite you to take part in the research.

This would involve completing a battery of online questionnaires covering psychological concepts such as optimism, life-satisfaction and self-esteem, along with more personal questions such as age, weight and satisfaction with surgery. However, no personally identifying questions are asked, such as your name, so you will be anonymous. This process could take between 10 minutes and half an hour to complete.

I am not affiliated to any NHS Trust or clinical practice, so there will be no benefit or harm caused to your treatment plan by taking part.

If you decide to take part, simply click on the link at the end of the page and you will be directed to the questionnaires. You will then see a more detailed description of the study. You can abort participation at any time by clicking on 'exit' and your data will not be stored. When you have completed the questionnaires, a message will appear on the screen to thank you for taking part, along with a unique participant number. You should make a note of the number as this is the only way of linking your data to you. If after you have taken part, you change your mind and wish to have your data removed from the study, simply contact me with your unique number and I will remove it.

Thank you for reading this message. If you would like further information please contact me by phone on 0151 231 4343 or by email: v.j.todd@ljmu.ac.uk

The findings from this research will be posted on this forum in due time.